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A NEW OUTLOOK ON THE PHYSIOLOGY AND PATHOLOGY OF MENTAL AND EMOTIONAL STATES *

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(WITH SPECIAL PLATE)

The Present Impasse in Mental Disorder Research

The central nervous system contains a large number of neurones each with cell body, dendrites, axon, collaterals, and synapses, connecting with one another in a manner similar to the communication lines of a number of automatic telephone exchanges; the physiology of the relation of this complicated system of neurones to mental function, emotional reaction, and conduct is, however, obscure. Eminent scientific men have spent their lives in this research, but their work has merely added to our already vast store of knowledge without solving the main problem. At the recent Royal Society of Medicine discussion of the relation of endocrines to mental disorder no agreement was come to regarding this, and for various reasons the discussion was not published; at the psychiatrical section Dr. E. Goodall in his presidential address lamented the fact that in spite of enthusiastic work over the last half-century little real progress in either aetiology or treatment had been made. He said: "We have in my opinion made no advance in our knowledge of the pathogenesis of the psychoses." In America, Freeman (1937), after ten years' intensive research in psychiatry, says: "Little more is to be gained from the study of the anthropologic, nosologic, or pathologo-anatomic features of the body in persons suffering from mental disorders." Hoskins (1937), with reference to schizophrenia, states that "the morphologic pathologist has sought in vain for a basis of the disorder." Fulton says that although physiological functions have a cerebral localization few would venture to localize the higher intellectual functions; Lashley says, "I am coming to doubt the validity of the reflex arc hypothesis even as applied to spinal reflexes"; and Professor Golla in his 1937 Maudsley lecture said the physiological make-up of personality does not admit of description in purely scientific terms.

The biogenetic deteriorated-neurone theory of germ-plasm defect, with possibly a few rare exceptions, can no longer be upheld, since the evidence upon which hereditary theories have been based—apart from the conditioning of environment—has been shaken by Paterson, Penrose, and Findlay. The success of various shock treatments (malaria, hyperpyrexia, and insulin)—although this therapy is possibly on the right lines—is without approved explanation. The toxin-impaired-neurone theory, which we have cherished so long and expended so much energy upon, is untenable for reasons which I shall give later; and the work of Pavlov's school on conditioned reflexes involves almost incredible precautions in the isolation of animals during experiment, in order to eliminate the hypothetical investigatory reflex—precautions totally out of proportion to what we know from our own observations and experience are necessary to establish conditioned reflexes in ourselves or animals, suggesting that the theoretical basis upon which they are working is incomplete. Sherrington (1933) says: "We have to regard the relation of mind to brain as still not merely unsolved but still devoid of a basis for its very beginning." The question naturally arises whether the physiological conception of mental and emotional states upon which research is based is lacking in some fundamental quality. Superstition demands an infinitely more complex control of the already complex nervous system, and thus hinders study of a humbler control by the vascular system.

Higher Reflex Action in Relation to Mental and Emotional States

Neurones transfer energy by electrical impulses† which cease at the next receptor organ or dendrite after having there effected an electro-chemical ionic change (liberation of potassium ions). In the higher animals this change results in a synthesis of a transmitter substance which, if quantitatively sufficient, effects a motor response or a discharge of the neurone with which it is in contact, the new electrical impulse thus set up having different characteristics from the original impulse. A sensory impulse is thus transmitted by alternate physical and chemical agencies, the latter (but not the former) often reinforced by other impulses, till eventually an end-organ is excited (motor response), or it becomes lost by reason of quantitative insufficiency of some synapse in its path. Stimuli reaching the central nervous system and the nerve potentials there built up are annihilated within a fraction of a second; even the central excitatory and central inhibitory states (Sherrington school) attain their maxima in 0.006 and 0.05 second respectively (traces only remaining as long as 0.015 and 0.2 second respectively); all such are instantaneous in comparison with the time duration of mental and emotional states (hereinafter referred to as m.e.s.). The brain itself is incapable of

* An amended lecture read to the Midland Mental and Pathological Society, October, 1937.

† Chemical diffusion along an elephant's motor nerve would take geological time to effect a response.

originating nerve excitation, and the widespread faulty appreciation of this fact in relation to the anatomical "centres" of physiological function in the brain has resulted in the appearance in the literature of erroneous statements of hormones "stimulating" brain centres.

Mental states, although physiologically associated with the central nervous system, possess a somewhat different function and characteristics; attempts to identify them have been and always must be failures. Sherrington (1933) says that "the history of the brain seems to suggest mind as at the outset a sort of adjunct to the nerve management of motor behaviour." Parker (1932) says the dawn of intelligence is seen in the capability of a primitive animal to refuse food when engorged. The word "mind" is best limited to such differential control of alternate nerve pathways (see Fig. B) influencing behaviour, and includes also subconscious function. The distinction between subconscious and conscious varies in the one direction with evolution, growth, and age; and in the other with learning, training, or physiological defect, although limited in the latter respect. The conscious attempt of the child in its first walk contrasts with the adult's conscious attempt at directing any part of the walking phenomena—which decreases rather than increases efficiency; and the brilliance of an artistic performance may be enhanced by a slight general mental inhibition (alcohol). Skilled movements, such as those of pianists and typists, are due to a finely detailed control of synapses; a really expert skilled worker can read, talk, and otherwise pay little conscious attention to his work whilst at the same time doing it quite efficiently.

Mental function is usually somewhat vaguely identified with dynamic activities incident to the characteristics of nerve impulse which have been established by the study of isolated muscle-nerve preparations, together with the principles of functional integration of neurones, conditioned reflexes, and supposed, but impossible, long delay paths in the central nervous system. A single nerve impulse is exceptional rather than the rule, what is generally regarded as an impulse being shown by electrical methods to be built up of a large number of successive impulses. The central reflex time is practically instantaneous, being in some instances less than half the total reflex time; motor effects of longer duration can only be due to *repetition* of the original or other stimulus. The time relations of higher reflex action of the central nervous system, assuming the stimulus is not continued or repeated, therefore cannot be conciliated with those of m.e.s. (which take time to develop and persist several minutes, remaining as traces hours, days, or even years afterwards); thus the latter must have a different physiological basis. Apparently no one has previously attached any importance to the fact that m.e.s are static rather than dynamic phenomena, and that they are potentially independent of the higher reflexes of the central nervous system whose metabolism they control.

Conduct in Relation to Mental and Emotional States

Since motor behaviour (which is the dynamic end-result of higher reflex action) is constantly changing, even in the same individual, a consideration of the controlling influences of m.e.s. upon conduct is necessary. Certain facts are readily ascertainable from our own experiences; for example, the same stimulus may result in different motor effects under different circumstances—that is, with differing m.e.s. The reaction and behaviour to a plate of hot soup at the beginning or end of a heavy dinner typify the most primitive example of the same stimulus resulting in a behaviour determined by the then existing mental and emotional state; the word "cats" to a dog nearly asleep may evoke partial opening of one eye, but if the dog is alert and there is a near-by rustling, immediate action ensues, involving the *whole* musculature of the animal. Conversely, widely different stimuli may produce similar motor responses: recognition—which is a mental state—can be observed in a dog receiving an olfactory, auditory, or visual stimulus from its master. Stimuli received during any particular m.e.s. have their characteristic limitation of motor response (conduct)—a fact exploited in political gatherings, and shown by the example that a well-meaning harmless intervener in a quarrel may get his nose broken; docile animals when frightened, or in other unaccustomed m.e.s., may scratch, bite, or otherwise harm their keepers.

Many stimuli received during a certain m.e.s. are lost or inhibited by training; all others automatically (robot-like) result in responses (conduct) in conformity with the particular mental and emotional state. A quiet demeanour in a sick-room is essential because the patient is consciously or unconsciously preoccupied with painful stimuli (an increased activity of those synapses which we know subserve the reflex paths of pain being necessarily paralleled by increased local capillary function), and therefore any uncompensated stimulus intensifies shock—the m.e.s. equivalent to subconscious pain. Unexpected loud sounds or strong stimuli cannot readily be compensated, and elaborate precautions are sometimes taken to prevent street noises reaching the sick-room. When an "irritable" mood prevails, the wireless, clock-tick, canary, door-bell, telephone, and animals' and children's noises are stimuli which may and do excite impulsive behaviour, whereas with a good mood such sounds are stimuli to appropriate motor responses.

Emotional states (anger, friendliness, hostility, approval) are clinically recognized by the facial appearance or attitude. A mother's estimation of her child's capabilities is often emotional rather than intellectual; but such distinctions are of little import, since both mental and emotional states are dependent upon the same mechanism, the only real difference being the fewer possible number of capillary patterns in the brain stem (emotional) as compared with those of the cortex (intellectual). Mental states are best visualized by reference to commonplace expressions such as "remembering," "change or frame of mind," "conversion," "discipline," "bias," "opinion," and "temporarily insane." States alternating between normality and senility are illustrated by aged acquaintances, in whom when undisturbed there is lack of expression, with lustreless eyes and slow movements; but on mention of a favourite topic the eyes sparkle, the features show emotion, the facial furrows disappear, and an associated mental acuity develops which reverts to the original state on changing to another topic of little interest.

Conduct in relation to specific stimuli is therefore not due, as often supposed, to a more or less permanent integrated nervous path through the central nervous system, nor is it even due to a large mass-inhibition of unwanted motor responses; it is due rather to a capricious control of *all* the related delicately balanced synaptic paths by a mediator, known clinically as m.e.s., which enables each and every muscle of the body to take its share in the general attainment of some effect—as seen in cinematograph pictures and photographs of professional athletes and sportsmen. Fig. A shows diagrammatically how this happens when the mediator inhibits or facilitates synapses collected in groups.

Integrity of the Central Nervous System in Mental Disorder

In psychiatry none of the present theories of disordered mental states attempts to account satisfactorily for the clinical remissions and resuscitations which are universally recognized. A patient on admission to a mental hospital may temporarily so improve that certification is very hard during the first two or three days. Dr. D. McRae has remarked that mental hospitals would be extremely difficult to manage were it not for the fact that the majority of the patients are comparatively lucid for most of the day. Temporary mental improvement follows any new treatment, a fact which has given bias not only to individualistic conceptions of aetiology but also to the patient and his relatives in the use of patent medicines and palliative home treatments that are quite devoid of real therapeutic value. Dr. A. M. McCutcheon has told me that a patient in his care maintained a mute vegetative existence for sixteen years, during which he "couldn't have been more like a cabbage"; he then had a fatal attack of pneumonia, coincident with which his mental clarity returned and he asked for his friends, with whom he conversed in a perfectly rational and lucid manner. In 1929 Loevenhart discovered that by asphyxiating mute and apathetic cases of mental disorder almost to the point of death there followed a period during recovery when they became perfectly rational and apparently mentally normal; unfortunately, as the state of cerebral stimulation passed off the identical mute apathetic state always recurred. Other methods of cerebral stimulation are known, such as heavy poisoning with sodium amytal, and recently Hallay invented a method of so-called brain massage by which restoration of sanity in a mentally disordered case was possible by alternate rhythmical compression of the jugular veins. Even certain states formerly considered neurological (torticollis and Parkinsonism) are similarly temporarily relieved by such methods of cerebral stimulation, but they always recur to the identical original condition as the stimulation ceases.

The lucidity, which occurs naturally, or after shock treatments (primitive, surgical, protein, insulin, and others), after prolonged narcosis, and during infections or artificial cerebral stimulation, establishes the significant fact that the synaptic connexions of the central nervous system in the mentally disordered states may, in contrast to the permanent dementia that is due to destructive lesions of nerve parenchyma, remain for many years inert but intact and capable of functioning on the normal personality pattern. This anatomical integrity of the central nervous system is illustrated in its simplest form in stammering—where the nerve reflex pattern of speech is obviously intact, but where direct function is in some way inhibited, as by spasm and ischaemia of the cortex; and in the restoration of lost function seen with excitement in cases following epidemic encephalitis. A story relates how an ancient relative rushed into the road and saved a child from a runaway horse-and-cart; for years before and for ever afterwards he was quite unable to walk!

Neurological conditions are occasionally seen in mental hospital cases, but not to the extent generally supposed, and it is believed that application of the differential diagnostic test of cerebral stimulation would show that some of these conditions are not really neurological, in the sense of nerve pathology, but psychiatrical (meaning a disorder of the mediator of alternate synaptic functions —that is, the m.e.s.). When loss of nerve elements occurs the reflexes dependent upon such elements are lost for ever—and gross atrophy of the cortex has long been associated (quantitatively, according to Lashley) with dementia; nevertheless the occurrence of lucidity from natural or artificial means, even if only temporary, firmly establishes the integrity of that part of the central nervous system subserving the recoverable function in mentally disordered and neurological cases, including clinical dementia without gross brain atrophy.

Synaptic Patterns and their Control

Many speculations have in the past been advanced of the identity of m.e.s. with synaptic function. McDougall (1901) says the physical basis of memory is of the nature of a dielectric stimulation at the synapses; in other publications he introduces speculations of synapses as the seat of psychological processes, consciousness being a fusion of many such activities. Pavlov considered the mind as a mosaic of inhibitions and facilitations of synapses, but emphasized its dynamic character. Others have attempted to correlate mental disorder with the pathology of the cerebral vascular system: among these the work of Spielmeyer will always be remembered, even although his later opinion was that the areas of functional ischaemia and necrosis described by him could not usefully be correlated with a fundamental relation to mental disorder. To these workers the extreme vulnerability of the ganglion cells to oxygen lack has been a stumbling-block causing them to abandon some useful preliminary work. For example, a significant experiment was published by my predecessor, the late Sir Frederick W. Mott (1907), who applied a stimulus to the leg cortical area of the brain, at the same time firmly pressing upon the upper cord sufficiently to indent it, and noting that motor impulses were not affected by such pressure; he then applied light pressure upon the lumbar cord, just enough to cause ischaemia of the cellular (actually of the synaptic) area, upon which impulses promptly ceased, even considerable increase of the strength of the stimulus failing to effect any response of the leg muscles.

The transmission of impulse within a neurone follows an "all or none" law; its physical character admits no modification, and it does not suffer decrement, as was formerly supposed, when a portion of nerve fibre is narcotized. Decrement occurs at, and only at, the synapse where the original nerve impulse ceases and chemical transmission takes its place. The dendrites of a neurone have many synaptic connexions, and are influenced by numerous inhibitory states and excitatory stimuli, which, if in an exact time-identical phase, would leave an effective or insufficient physio-chemical resultant. Infinitesimal time differences in the reception of such stimuli, however, are important, since at any instant the resultant may excite the neurone, then briefly but quite refractory to other stimuli, which are then lost. Sherrington (1933) says that "if nerve activity has relation to mind one can hardly escape the inference that nerve inhibition must be a large factor in the working of the mind." Synaptic function can be inhibited by reduction of its blood supply, any such inhibitory delay preventing premature discharge of the neurone and allowing summation of more stimuli, with greatly enhanced value of the motor response. Reflexes which previous experience has shown to be advantageous can be facilitated by increased blood supply to the synapses, and disadvantageous responses inhibited by relative ischaemia of the respective synapses, this control being part of the capillary mosaic and therefore part of the m.e.s. existing at the time.

A slight ischaemia is known to increase decrement to extinction of impulse; emptying the retinal arteries by simple pressure on the eyeball causes total temporary blindness (Barnert); even electrical records of brain activity show the dependence of brain function upon an adequate capillary blood supply (Adrian, communicated privately). Penfield showed that conduction through a synapse is readily abolished by CO_2.

In the skin and viscera, where the function of small areas is similar, a local rhythmical variation in capillarity normally occurs, controlled chiefly by metabolites. In the central nervous system, where the function of small adjacent areas is widely different, such rhythmical changes would result in confusion of conduct; and therefore this rhythmic characteristic has probably undergone in the brain certain necessary adaptations to the physiological requirements, by selective local control of the smaller vessels, not only by hormones but also by collateral impulses from higher reflexes of the central nervous system and by sympathetic stimuli; the metabolites and hormones sustaining the variations in the mosaic of capillary pattern induced by the more rapidly acting central nervous system (somewhat analogous to Creed's red tonic muscle supporting the rapidly acting pale muscle). Fig. A shows a theoretical diagram of how a mosaic of vascularized areas can determine the facilitation or inhibition of impulses from the various sensory stimuli of light, sound, etc., so that the type of motor response is conditioned by the mental or emotional state of the individual and not by the stimulus. Sherrington says that "a drug may in a second wholly reverse a reflex by tilting the inhibition-excitation balance," this phenomenon being presumably dependent upon the drug acting on the vascular supply of the synapses.

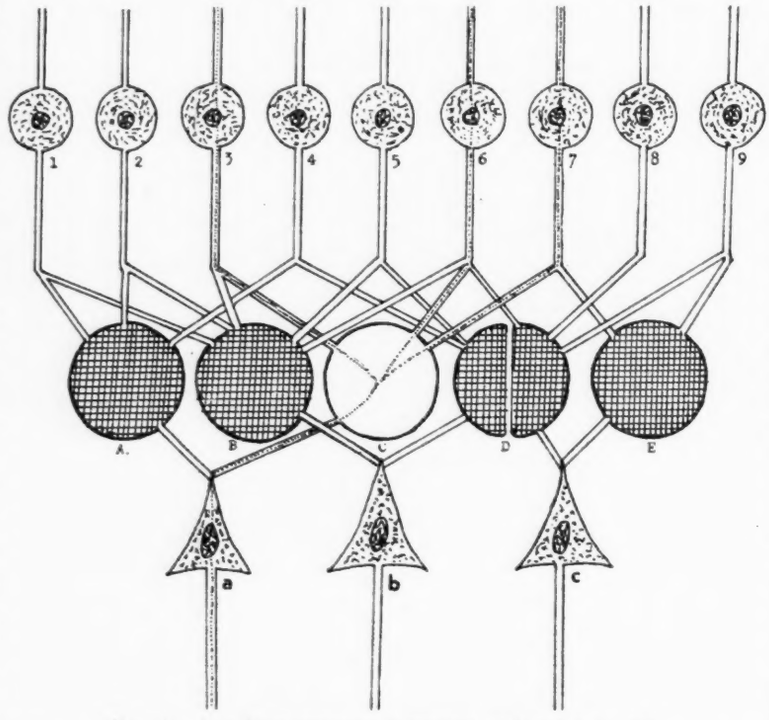

FIG. A.—1 to 9 are neurones in sensory path and a, b, and c motor neurones. The synapses are collected in areas A to E. Area C transmits (dotted lines). If area B instead of C transmitted, then the same impulses would either be lost or would excite a different motor cell; other impulses—1, 2, and 5—would also excite b.

Sensory impulses are related to conduct through mental and emotional states, here shown as a vascular control of synapses in areas A to E.

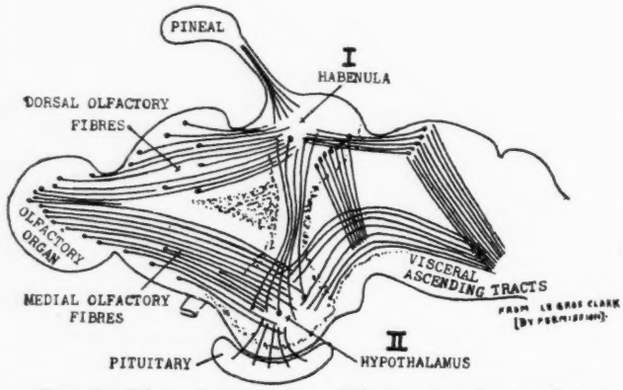

FIG. B.—Brain of cyclostome. Olfactory impulses reach two brain areas of widely different function.

Physiological problems having an important bearing upon the mind are suggested by the anatomical distribution of fibres from a sensory organ to widely different regions of the brain. Fig. B shows the brain of a cyclostome (le Gros Clark, 1932); olfactory fibres pass from the olfactory region both to the pineal-habenula and to the pituitary-hypothalamic regions, where function is as widely different as can be postulated. Hunger or disgust may represent an alternative choice of use of such possible reflex paths (primitive m.e.s.), and how far this choice is dependent upon the relative capillary blood supply to the respective alternate regions can be proved by direct observation, or by application of my capillary stain, in crucial test experiments (in states of full and empty stomach, etc.). Potential m.e.s. exist without any concomitant action of the central nervous system—that is, motor behaviour—so long as no stimuli reach the controlled areas. The static quality of m.e.s. and their potential independence of the central nervous system constitute the new outlook, and are of primary importance in the correlation of the mind and its disorders with the medical sciences.

The mental and emotional states can be associated, and in my opinion identified, with the cortical (not only pia mater) capillary mosaic pattern, which provides an efficient mechanism for the actual control of the patterns of synaptic junctions of the 12,000 millions of neurones of the central nervous system. This materially simplifies the bewildering numerical possibilities of interneuronal connexions, which we are told far exceed seconds in geological time or atoms in the universe, and reduces the number to that which experience leads us to expect by variation of sections of the cerebral capillary mosaic.

Physiology and Biochemistry of Synapses and Cerebral Vessels

Woollard has shown us that systemic vasoconstrictor nerves have two origins: (1) proximal from the sympathetic ganglia, and (2) distal by way of the somatic nerve trunks. Villaret, Cachera, and Fauvert (1937) have recorded photographically actual spasms of pial vessels. Stimulation of the sympathetic groups of fibres on the large vessels of the brain has a local or proximal effect upon arteries rather than a general distal effect on the ultimate distribution of the arterioles, and it is possible that the central nervous system contributes locally to the

control of the arterioles as Woollard has shown for the somatic capillaries. The carotid sinus merely determines the pressure distribution between the head and the rest of the body, electrical stimulation dilating the cerebral vessels: the importance of gross interference of function from contiguous sepsis in relation to disturbed mental states should not be minimized until first subjected to histological proofs. Section of the cervical sympathetic increases the number of patent brain capillaries, and mental improvement has followed some of these operations in selected cases (Royle, 1932).

Danders (quoted by Forbes, 1928) in 1850 obstructed the nose and mouth of animals for ten seconds and observed a dilatation of cerebral vessels through an air-tight window in the skull, using a magnification of × 45. Constriction* of cerebral vessels occurs when the carbon dioxide is low, when the oxygen is high, when the blood becomes hypertonic, when the cervical sympathetic is stimulated, when the fear area in the hypothalamus is stimulated (Stavraky, 1936), and with adrenaline after sympathectomy or ergotamine. Dilatation occurs with increased carbon dioxide, trauma, acidosis, stimulation of the seventh nerve, fall in blood pressure, gaseous embolism, acetylcholine, histamine, adenylic acid, nitrites, and a number of other local elective substances, including, for example, that of pituitary secretion on the parietal region. Stimulation of the tuber or pressure with a small sponge, or stimulation of the ventral and medial parts of the thalamus, also dilates pial vessels. Himwich (1937) finds that, in contrast to other viscera, the arterial quality of the venous return from the brain in dogs increases parallel with hypoglycaemia, giving a biochemical explanation; another explanation is also possible, since this phenomenon under other conditions is accepted as proof of cerebral capillary dilatation. Experimental pharmacology shows the selectivity of capillary reaction to drugs. Both histamine and CO_2 contract the capillaries of the lungs but dilate those of the brain; urethane dilates capillaries but not arterioles. Strychnine has formerly been supposed to act directly upon the synapses, but Olkon (1930) observed by direct microscopical examination the contortions, kinking, and spasms resulting in brain capillaries from injection of strychnine into animals, a finding which, taken in relation to clinical symptoms, makes a significant contribution to the new outlook I have put forward in this paper.

A fall or rise in blood pressure is accompanied by distinct modification of feeling and thinking (Gordon, 1930). Mental effort causes an increase in the oxygen and decrease in the carbon dioxide of the jugular blood; that is, a general dilatation of cerebral capillaries (Lennox, 1931). The rapidity with which a "change of mind" or emotion can follow sensory stimuli shows that impulses of the central nervous system are of primary importance in adjusting the mosaic of capillary pattern to altered circumstances and behaviour requirements. Once "set" a capillary pattern tends to persist and even to re-form after diversions or sleep.

The controlling influence of the mosaic pattern of capillary activity upon the pattern of facilitation or inhibition of groups of synapses receives support from recent work on the relation of acetylcholine to synaptic function. A nerve impulse releases potassium ions at the synapse, which in cholinergic fibres effects a synthesis of acetylcholine and excites the second neurone. When an excitor effect is thus transmitted through a synapse by acetylcholine the latter leaks out around the muscle or nerve; potassium ions similarly leak away during passage of a nerve impulse, and both these substances cause severe depression of further responses to subsequent nerve stimuli. The capillary circulation immediately and completely removes any free acetylcholine that is not limited to the synaptic membrane, also restoring altered salt concentrations; such action may be also said to effect a control of synaptic metabolism and function. Repeated stimuli of the cervical sympathetic cause a continuous output of acetylcholine from the sympathetic ganglia, which, however, soon decreases in amount (recognizable clinically by diminution of motor effects and chemically by the lesser amount of acetylcholine in the perfusate), but suddenly increases, as shown both by motor response and by its quantitative increase in amount in the perfusate, when a small quantity of blood plasma or serum is allowed to reach the synapse again. The vascular supply is therefore normally of primary importance in maintaining the local synthesis of transmitter substance (acetylcholine) and in removing such acetylcholine as has leaked away from the synapses into the surrounding tissue, where its effects are distinctly undesirable. The relatively enormous amounts of oxygen consumed at the synapses (amounting to one-tenth of the total body consumption of oxygen) also indicates the dependence of synaptic function upon the blood supply (for further correlations see Pickworth, 1937).

Neurones and the Action of Toxins

The inhibition of function which often characterizes cases of mental disorder, together with the well-known fact that brain tissue absorbs with avidity many kinds of toxins mixed with it *in vitro*, has directed many, including myself, to the attractive theory of direct action of toxins upon the ganglion cells of the brain; and some regions of the brain have been held to be specially vulnerable to the action of toxins (Vogt's pathoclisis).

Intestinal toxaemia has for a long time been associated with mental disorder, and especially with the katatonic states: my work on dysenteric infection prior to admission to mental hospitals and institutions for defectives has shown the importance of such infections as aetiological factors in both clinical conditions (Pickworth, 1927). It is known that bacteria can decarboxylate proteins, giving rise to most powerful pharmacological substances, whereas if previously deamidized by the liver the products are harmless. The action of such poisons has been studied by Ferraro and Kilman (1933) and the brain changes described. Usually toxic action upon nerve cells is histologically demonstrated by cloudy swelling, bulbous processes, alteration of staining reaction, shrinking, vacuolization, pyknosis, displacement and extrusion of nucleus, cell disappearance, and rings of phagocytic cells; special cells from the glia appear to take up the fat and debris, and may remain as scar tissue. Spielmeyer showed that there may be a purely glial response to noxious agents in bacterial infections (glial foci also occur in trichinosis).

It will, however, be evident from the preceding pages that degenerative changes in the brain parenchyma, although frequently present and contributing much to the clinical features, especially in institutions for defectives, have only a secondary relation to the actual phenomena of mental disorder, the lesions produced by destruction of nerve tissue being permanent dementia or neurological rather than psychiatrical. Even a partial or reversible toxic action upon nerve cells cannot be admitted,

* Observations limited to the straight portions of pial arteries need revision following the demonstration, by Villaret, Cachera, and Fauvert, that spasmodic constrictions are localized to just beyond arterial bifurcations.

because of the difficulty of explaining in such terms the lapse into the identical disordered mental state, which rapidly follows the lucid interval produced by artificial cerebral stimulation (or excitement in the case of alternating normality and senility quoted). Friedemann and Elkeles (1934) have shown that absorption of toxins by the brain from the blood only exceptionally occurs (with such powerful toxins as cobra venom and lamb dysentery toxin) under normal conditions owing to the perfection of the haemo-encephalitic barrier; but the action of intestinal and other toxins upon the *vascular supply* of the brain is supported by many concordant observations. The above-mentioned toxic effects upon nerve cells are also seen in simple anoxia, and therefore should be considered secondary to an ischaemia induced by the action of toxins upon the smooth muscle of the capillaries.

The toxin responsible for brain changes in general paralysis is said by Neuberger, Metz, and Wilders to act on the cerebral vessels; and Merritt, Putnam, and Campbell (1937) say that degenerative changes in general paralysis may be regarded as secondary to anoxaemia from endarteritis of the small vessels. Alcohol, well known in its effect upon the m.e.s., hitherto has been considered to act upon the ganglion cells, but Thomas has shown (1937) that it has a primary action upon the cerebral blood vessels. Orr and Sturrock (1922), by placing staphylococci in contact with the common carotid, found lesions in the distribution of the cerebral arteries *primarily vascular* in nature. Even the clinical features of toxic action, such as loss of strength, loss of weight, digestive disturbances, increased pulse rate, dry tongue, flushing, pallor, circulatory disturbances of the skin, and peristaltic unrest, are indicative of primary action upon the capillaries of the metabolic centres rather than upon nerve parenchyma. The immunity of the ganglion cells of the central nervous system from prolonged toxaemia is demonstrated by dementia praecox cases, where over many years' duration the presence of circulating toxins, resembling ergot or histamine poisoning (Bayard Holmes), is evident from a study of the vascular system; the brain, however, shows no distinctive gross lesion, and Freeman (1933) speaks of the dementia praecox brain as being "particularly normal." The toxin-inhibited neurone theory must therefore give place to the better-substantiated theory of primary toxic action upon cerebral capillaries. Meyer (1936) and others support this opinion in relation both to selective vulnerability and to many pathological findings in mental deficiency, Spielmeyer also having emphasized the importance of an effect via the vascular system.

Action of Endocrine Secretion

"All living cells give off substances into the blood stream which influence the others so that internal secretion is a fundamental vital phenomenon as old as the vascular system itself" (Cowdry, 1934). About two dozen hormones are known which have their action through the vascular system, but little study has yet been made of their selective action upon the capillaries of the reacting organs. Hypothyroidism is associated with fibrotic ischaemia of the thyroid gland, and hyperthyroidism with hyperaemia—and therefore hyperactivity—use being made of this in the local application of ice (generally limited to shortly before surgical operation). The specific hormones of the pituitary which influence growth and activity of the adrenals, the thyroid, and the mammary gland in all probability have a selective action upon the smooth muscle elements of the capillaries of the respective glands (Jones, 1936, has shown that the capillaries consist of innervated smooth muscle). In practice hyperaemia of the mammary gland is induced by frequent bathing with hot water, with satisfactory results. The recent finding of many closely related adrenaline-like substances and pituitary hormones contributes to the specificity of local capillary reaction in both systemic and cerebral circulations. Schmidt (1935–6) observes a differential response of the cerebral capillaries to the action of pituitary hormones.

The relation of endocrine secretion to the m.e.s. is only vaguely understood, but the new outlook I have put forward has materially simplified the problem. The normal changes of capillary pattern corresponding to the m.e.s. are to some extent dependent upon the selective reaction to the presence of endocrine secretions which Schmidt has shown. Clinically, fear is associated with mobilization of adrenaline; the injection of sex hormone into animals deprived of gonads and genitalia induces sexual behaviour; a moral degradation accompanies some cases of dyspituitarism, precocity occurs with pineal tumours, sluggishness in myxoedema or adrenal insufficiency, and anxiety at the menopause. Advanced endocrine disturbances are only occasionally found in mental hospitals, but minor endocrine disturbances are universally present—limited only by the clinical acumen and enthusiasm of the observer. Fluctuations in the size of the thyroid (girth of neck) are observable in the cyclic states, and the pituitary gland is sometimes involved in septic extensions from chronic sphenoidal affections (Pickworth, 1935).

Hormonic action upon cerebral capillaries, being thus of primary physiological importance in normal changes of the local cerebral capillarity corresponding to the m.e.s., may later be shown to cause at least some of those pathological disruptions of the cerebral capillary mosaic associated with mental disorder. At present, however, we can only assume that some other pathological causes are primary, and that mental symptoms are then intensified by abnormal endocrine activity (such as mania in Graves's disease, and resembling the unmasking of latent character traits by the influence upon the cerebral capillaries of over-indulgence in alcohol).

Pathology of the Cerebral Capillary Pattern

Subdural haemorrhage illustrates simply the inhibitions related to certain motor cortical areas, and subcortical tumours—those symptoms of psychiatrical nature, both the results of pressure ischaemia; such symptoms of incipient insanity can, and have been, cured by simple removal of the tumour, and cortical ischaemia symptoms relieved by evacuation of the clot.

Pathological disruption of the normal capillary patterns results from abnormal accumulations of metabolic products when stimuli are continued in spite of poor local blood supply (worry); from chronic pain stimuli (toothache, sinusitis); from bacteriaemia of saprophytic organisms which lodge in cerebral capillaries (focal and intestinal sepsis—Pickworth, 1935); from haemorrhages, near-by necrotic foci, and tumours; and from head trauma (commotio cerebri). Pathological ischaemia occurs by reason of spasm, oedema, diapedesis, capillary haemorrhages, emboli, or thromboses—commonly found in brains from mental hospital cases. A limitation of blood flow to large areas is imposed by atherosclerotic lesions, aseptic meningitis, tumours, chronic subdural haemorrhages, and cardiac decompensation; while hyaline degeneration in the vessels, perivascular cuffing, and intimal thickenings reduce local respiratory exchange.

The posterior cerebral artery supplies the walls of the third ventricle, a large part of the thalamus, and the choroid plexus, as well as the visual cortex; in conditions of atheromatous restriction of the vertebral or basilar lumen an activity of those brain areas supplied by the posterior cerebral artery necessarily depletes the blood supply of the medulla, according to Ricker's peristasis theory with Hiller's corollary (Pickworth, 1937). This might result in an ischaemia of the vital centres which must at all costs be avoided, and so activity of the posterior cerebral artery becomes physiologically inhibited. As the control is not (as one would suppose from its morphology) from the vertebral plexus, but from the carotid plexus via the small communicating arteries (Williams, 1936), such vital implications may very well keep the unfortunate sufferer fully occupied with his internal complications—social activities and even feeding instincts becoming unimportant by comparison. A simpler case of spasm of vessels to vital centres probably occurs in reflex pain of toothache, and might be correlated with the associated mental condition of irritability and incapacity.

Ischaemia of peristatic or pathological origin results in confused behaviour and permits working sections of the cerebral capillary mosaic to be wrongly associated with normal or unrelated sections. During such pathological disturbances an untimely activity of, say, the gonads or pituitary secretions upon local sections of the cerebral capillary pattern can reasonably be supposed to be the cause of obscene language not infrequent in mental disorder cases—that is, however inappropriate with regard to external circumstances, the conduct is nevertheless appropriate to the internal but untimely demands of the individual (*Hamlet*, IV, v, 8). Conversely, it is known that frequent changes of m.e.s., as by multiple interruptions of conditioned reflexes in dogs, cause neurasthenia; and examples are only too numerous where a continued repetition of changes of mental content (such as occurs at puberty and the menopause, and in alcoholic indulgence, remorse for crime, or enforced study), when reinforced by bad training, digestive derangements, or a bacteriaemia from local septic conditions, has resulted in a derangement of the cerebral capillary pattern and thus a predetermined behaviour characteristic of mental disorder.

Mental disorder can therefore be identified with a mixing up of normal and abnormal capillary mosaic patterns. Fragments of some pattern may be assumed to persist coincidently with fragments of other capillary patterns, in which case a stimulus reaching the brain results in a behaviour corresponding with the predominant type of pattern (that is, the m.e.s.), coloured by other fragmentary patterns also existing at the same time.

Military discipline builds up an m.e.s. which enables a soldier in war-time to obey orders an untrained civilian could not, and typifies the automatic robot-like response to command which I have tried to show is determined by the capillary mosaic regulating synapses and therefore conduct. Persistent m.e.s. result not only from training but from pathological changes. It is obvious that when one alternative of two synaptic areas is facilitated by hyperaemia the other is relatively inhibited. In the excitement of sport an injury may be temporarily unnoticed. Excitement, shock, and fear inhibit pain. A mental patient with pathological fixed inhibitive states can actually evulse an eye or testis with little if any shock or pain; and the usual temperature response to lobar pneumonia or pyrexia-producing drugs is sometimes temporarily absent in the active phases of mental disorder.

At post-mortem examinations of mental patients yellowish areas can be found contrasting with the normal reddish capillarity in the cortex and basal ganglia. These yellowish areas are macroscopic confirmations of ischaemia which is revealed by my capillary stain. This stain discloses not only such gross irregularities of blood supply but also indicates slight differences in the vascularity of local areas, or cortical layers, which I have endeavoured to show have some physiological significance. (Injection methods cannot be used for this purpose, as they are unreliable with respect to incomplete filling in some cases and over-distension in others.) Gross local variations of the blood supply and the pathology of the vessels themselves have been described in my previous publications. The sections (Special Plate) from recognizable brain regions are given to show relative differences in vascularity of the same section, the thickness of the selected areas being in each case controlled by stereoscopic comparison: it is generally possible to use parts of the same brain for normal control. Fig. 1 (Special Plate) shows three selected areas from a section of the frontal cortex; it demonstrates hyperaemia (A), normal (N), and ischaemia (B) in a case of epileptic insanity aged 15; ganglion cells are also revealed. Fig. 2 shows a vascular area (A) and an ischaemic area (B) from a section of the motor cortex of a case of delusional insanity aged 68. (Compare also the size of the giant Betz cells seen in the lower part of both photographs with the relative capillarity.) Fig. 3 shows the occipital cortex of a case of schizophrenia: note the relative vascularity of the two areas A and B. The section also shows cells and demonstrates the band of Gennari. Fig. 4 illustrates the cortex of two contiguous lobules of the cerebellum, and shows an obvious difference in their vascularity: I have noted a rarity of gross lesions of the cerebellum—in contrast to the cerebrum—in mental hospital patients, but my technique reveals a pathology long expected but not previously demonstrated. The clinical significance of regional vascular irregularities, however, needs many more years of further patient study.

The study of mental disorder therefore becomes somewhat changed by the new outlook I have put forward. Histological lesions of the central nervous system are to be regarded as of only secondary importance to changes in the mediator of alternate higher reflex paths which I have correlated with the cerebral capillary blood supply to the synapses. Similarly more hopeful lines of treatment can be adopted: (*a*) preventive, by avoidance of, or by skilled nursing during and after, known causes of capillary pathology (head trauma, acute and chronic infections, dietary deficiencies and irregularities, digestive upsets, food poisons, undue excitement, etc.), and not excluding antenatal care; and (*b*) in established cases by attention first to the probable cause (for example, chronic sepsis—Graves, 1932; Watson-Williams, and others) and then by a more scientific study and application of drugs and treatments known to affect the capillarity of local brain areas.

Examples of the latter are seen in Poole and Nason's (1935) work with ergotamine causing contraction of dural vessels (its action on pial vessels is irregular), which has been used with success by M. O'Sullivan (1936) for the cure of migraine; Royle (1932) cured incipient insanity by cerebral sympathectomy in suitable cases; Graves's case (personal communication) of ligature of one jugular vein for mastoid complications showed immediate mental improvement, which has been maintained; C. Adler (1936) has used barbital with caffeine successfully for epilepsy; W. F. Duggan (1937) treated tobacco amblyopia with repeated injections of nitrites and acetylcholine; Barber and Tietz

(1937) gave daily doses of ergotamine tartrate, which they found diminished suicidal, homicidal, and destructive activity (Linderman observed the converse with adrenaline injections—namely, that patients became more subjective and introspective). Such treatments offer great individual and economic hopefulness, provided sufficient further scientific study of their relation to cerebral capillary function is made to render them scientific instead of empirical: in this direction the work of the Harvard Medical School, Boston, is to be highly commended.

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It is announced that one of the main subjects for discussion at the International Congress on Rheumatism now being organized to take place in Oxford in March is juvenile rheumatism. The views of experts from other lands on this serious malady will be of great interest, and meanwhile there is available Professor H. B. Cushing's recent Blackader Lecture (*Canad. med. Ass. J.*, 1937, **37**, 311) on this disease as it occurs among Canadian children. He places acute rheumatism and cardiac disease in childhood as taking "first place as a threatened danger to normal childhood and adolescence in this country," basing this upon figures which indicate that about 25,000 school children in Canada are afflicted with rheumatic cardiac disease. Professor Cushing reviews the possible means of attack upon this malady and describes the interesting results obtained at the Children's Memorial Hospital, Montreal, where for the past three years children with rheumatic cardiac disease have been treated in a special pavilion very much on the same lines as patients with tuberculosis are treated. It is too soon in the experiment for any definite conclusions to be drawn, but the entire staff of the hospital is convinced that the results obtained are measurably an improvement on those seen before this step was taken. Professor Cushing pleads for organized co-operative effort to secure recognition, supervision, and after-care of all cases of rheumatic fever. He sees the need for the improvement of social conditions, particularly as regards general hygiene and housing conditions. Thirdly, he makes the point that since relapses of rheumatic fever follow regularly on infections of the respiratory tract and of the throat efforts should be made to lessen such infections and improve the hygiene of the mouth and the throat of the community.

THE HEALING OF EMPYEMA CAVITIES

WITH SPECIAL REFERENCE TO ASPIRATION AND AIR REPLACEMENT AS AN AID TO OPERATION

BY

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(WITH SPECIAL PLATE)

Since the healing of empyema cavities has been investigated by repeated radiographs with lipiodol injection, it has been apparent on many occasions that the original drainage opening, though adequate at first, has during the course of re-expansion of the lung become unsatisfactory. Healing might often have been accelerated by better planning of the drainage opening. It seems that the exact shape and position of the cavity, and the way in which the lung will expand—things upon which the position of the opening must depend—are more difficult to assess than has been supposed. Ideally the drainage tube should pass perpendicularly through the chest into the empyema at a point in the wall which would normally be the last to heal. Although the attainment of this end—a matter of the greatest importance to successful treatment—might appear to be simple, it has in fact been found to present considerable difficulty. In order to place a drainage opening accurately it is necessary to understand the way in which the obliteration of a cavity normally takes place, the factors which govern this, and how they apply to the particular case under consideration.

Factors governing Healing

Healing of an empyema cavity must be distinguished from mere diminution in capacity. When pus is first removed there is in the acute case an immediate and notable diminution in the capacity of the empyema due to the return of the displaced mediastinum, re-expansion of the compressed lung, and elevation of the depressed diaphragm; but true healing is a comparatively slow

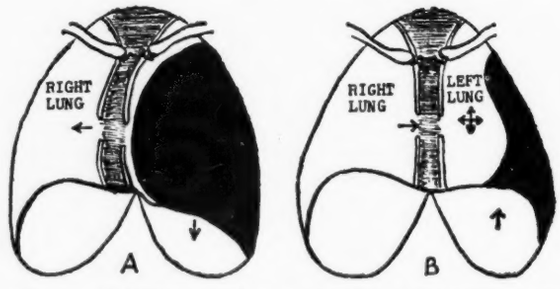

FIG. A.—Diagram showing mediastinal displacement, compression of left lung, and depression of diaphragm by a large empyema.
FIG. B.—The results of simple aspiration.

process, which depends upon the gradual and steady adhesion of the visceral and parietal walls of the empyema. The latter results from granulation-tissue formation and fibrosis all along the line of approximation of the two walls. If the pus removed from an empyema at operation is measured and the cavity immediately refilled with an antiseptic solution it is found that the amount of fluid required to fill the cavity is usually only a small fraction of the volume of pus originally present. It would be absurd, however, to suppose that to that extent healing had taken place. Figs. A and B

illustrate these immediate post-operative changes as they occur in one plane. Fig. 1 (Special Plate) is reproduced from a radiograph which was taken immediately after the aspiration of six pints of pus from the left side of the chest and the injection of a little air in order to demonstrate the level of the fluid.

Choice of Drainage Point

The line of inflammation at the union of the visceral and parietal walls of the cavity may be called the healing edge. If this line be considered as a circle, then, it might be supposed that healing would occur centripetally at an equal rate at all points of the circumference and that the ideal position of the drainage opening would be at the centre. In practice the line of union is usually irregular, but an accurate appreciation of the shape of the cavity before operation is nevertheless a guide to the choice of the point for drainage, which is most nearly equidistant from all the parts of the healing edge. The simple conception of an empyema of circular shape healing centripetally is a useful one in so far as it emphasizes the difference between the healing of an empyema and that of a simple abscess in the cellular tissues. It is, however, inaccurate in detail for a number of reasons. First, as stated above, the outline of an empyema is seldom circular; secondly, healing does not take place in a flat plane as on a sheet of paper but along the curved plane of the chest wall; and, thirdly, because inequalities in the elasticity of the walls make the rate of healing vary at different points. The second and third of these reasons require further elaboration. If the chest wall were quite rigid and the lung perfectly expansile, healing would occur along the curved plane of the chest and there would be complete re-expansion of the lung without any collapse of the chest. This end can be attained in the treatment of acute empyema if the chest wall is prevented from collapsing by the proper exercise of muscular control. All the walls of a chronic empyema may be equally rigid owing to the dense lining of fibrous tissue, and if such a cavity can be made to heal by simple drainage it may happen that the chest wall will collapse to meet the lung as much as the lung expands to meet the chest. In these circumstances healing may occur in a flat plane. If the walls of a chronic cavity are so rigid that obliteration is impossible after simple drainage, then the chest wall must be mobilized, and healing occurs along the plane of the rigid collapsed lung.

The third consideration is closely bound up in the principle of the second. Inequalities in the rate of healing at different points depend mainly on differences of elasticity, and these may be in either the parietal or the visceral wall. In the parietal wall the ribs and intercostal structures, the diaphragm, spine, and mediastinum may all be involved, and the rate of healing along these walls varies with their relative extensibility. Thus healing between lung and mediastinum is rapid compared with that between lung and chest wall. Differences also occur in the extensibility of the lung in different parts, and this is particularly well demonstrated in empyemata secondary to streptococcal pneumonia. In this disease the inflammation is primarily in the interstitial tissue of the lung, resolution is often incomplete, and scar tissue is formed. This may vary in extent in different parts of the lung, and therefore the ability of the lung to expand varies accordingly. It is sometimes seen that the most extensive scarring has occurred in the interlobar septum, and this layer of fibrous tissue acts as a rigid band between the hilum and the periphery of the lung, preventing expansion. Fig. 2 (Special Plate) is a radiograph of such a case, in which a streptococcal empyema occurred as a result of post-operative inflammation of the right lung. It was drained through an opening about an inch above the lower part of the cavity and half-way between its anterior and posterior extremities. Healing was delayed in the region of the interlobar septum, so that the drainage track ultimately became almost vertical, leading from the original opening below to the end of the thickened, scarred interlobar septum above. The illustration shows the track injected with lipiodol. It also shows the dense interlobar septum extending from the hilum out to the small residual empyema space at the periphery.

Classification of Acute Empyemata

The classification of acute empyemata into the syn-pneumonic and the post-pneumonic, and the general recognition of the significance of these types from the point of view of treatment, have done very much to reduce the immediate mortality from operation, but now that this lesson has been learnt a classification should be considered which would help to reduce the incidence of chronic empyema with its associated morbidity and mortality. To this end two groups, simple and complicated, are suggested. The simple empyema is one in which no permanent structural alteration has taken place within the lung tissue, and where, with adequate drainage, the lung expands completely to fill the chest with no deformity of the parietes. Such an empyema should always heal without difficulty, and if it becomes chronic this can only be as a result of inefficient drainage. The complicated empyema is one in which structural damage has occurred in the lung to such an extent that complete re-expansion is impossible, and in those circumstances not only will there be delay in healing but this will occur partly at the expense of the parietes. The factor that interferes with expansion may be an acute process such as a streptococcal pneumonia or, rarely, a more chronic one such as an underlying carcinoma. Strangely enough, the existence of bronchiectasis, though undoubtedly a cause of slow healing, is not so inimical to complete cure as might be supposed, and the reason for this is not far to seek. When an empyema develops in a patient with bronchiectasis the accumulation of pus in the pleura takes place at the expense of the healthy easily compressible lung tissue rather than the hard fibrosed part. The latter remains more or less stationary during healing, and obliteration of the cavity occurs as the result of re-expansion of the compressed healthy tissue. The healing of a simple basal empyema is usually associated with slight elevation of the diaphragm and obliteration of the costo-phrenic sinus. This is strictly a change in the parietal wall, and would be of no clinical significance if it were not for the fact that drainage tubes are sometimes inserted into the costo-phrenic sinus and that inefficient drainage almost invariably results.

The placing of a particular empyema into one or other of the two classes depends on the detailed clinical history of the case and the bacteriological examination of the pleural fluid. The most significant point in the history is the relation of the febrile attack to the pleuritic pain. In general it may be said that if the pleuritic pain occurs at the beginning of the illness the empyema is likely to be a simple one. The commonest inflammatory disease which does not cause permanent structural damage to the

lung is pneumococcal pneumonia, and this is most often the cause of simple empyema. If, however, a febrile attack is the initial disturbance, followed after some interval by pleuritic pain, the empyema is likely to be a complicated one. Streptococcal pneumonia, and pneumonitis secondary to lung abscess and bronchial block, start in the depths of the lung tissue and spread outwards to the pleura by the interstitial lymphatics, so that pleurisy occurs at a later stage of the illness.

Treatment

With regard to the treatment of the two varieties of empyema, it may be said that in no case does preliminary aspiration do harm, and that in every case this simple operation relieves the patient and at the same time gives valuable information to the operator. It must be admitted that where a cavity is filled with large masses of fibrinous clot aspiration is not always possible, but the routine attempt at the above procedure has been found to diminish the number of cases requiring secondary drainage operations.

It has already been mentioned that relief of pressure in an empyema is associated with immediate anatomical adjustments within the chest, and it is obvious that these changes must result in an alteration of the shape of the empyema cavity. When empyemata have been drained without previous aspiration it has sometimes been found that these adjustments result in the lung coming up flat against the end of the tube and so interfering with the drainage of a relatively deep space. This is depicted in Fig. C. Before the point of drainage is decided, therefore, it is an advantage to allow these immediate adjustments to be made by the aspiration of as much of the pus as possible, followed by radiological examination in two or more planes.

From every point of view it is desirable, before operation, to know these details: the shape, position, and size of a cavity after the relief of pressure within it; the composition of the parietal wall; and such information about the way in which the empyema will heal as may be deduced from consideration of its nature and the elasticity of its walls. To this end it has become the practice in the treatment of these cases to aspirate through a wide-bore cannula, where possible, as much of the pus as can be removed, and then, by leaving the cannula in position while detaching it from the suction apparatus, to allow a little air to be drawn into the cavity by the patient's own respiratory effort. The presence of air in an empyema cavity is not harmful in any way, but by creating a fluid level it makes accurate radiological examination of the cavity possible. Following aspiration, radiographs of the chest are taken in the upright position, in antero-posterior and lateral planes, sometimes one or other oblique plane, and occasionally in the prone position. From these films the best point for drainage is chosen according to the principles advanced above. The method of drainage, open or closed, is not considered to be of any importance so long as the tube is large enough and in the right place. A portion of rib is always resected. The above procedure has no influence whatever on the ultimate choice of treatment in a particular case; some are still treated by aspiration alone and some by aspiration followed by drainage, and the rules for the choice of the appropriate method are sufficiently well established to be omitted here.

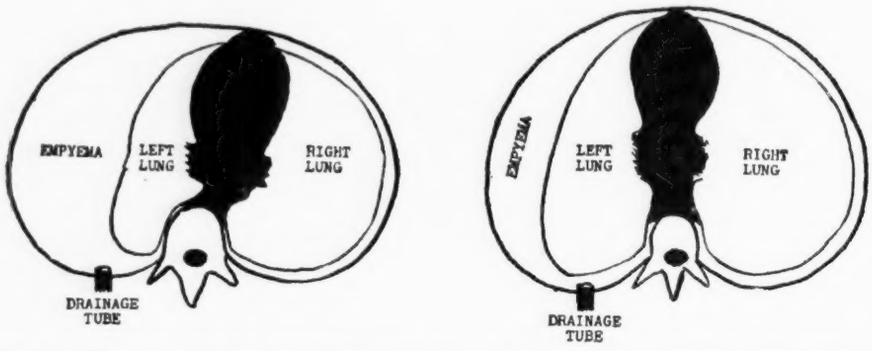

FIG. C.—Diagrams showing immediate expansion of lung, rendering drainage tube ineffective.

Summary

1. The way in which an empyema heals is discussed and the factors governing this are indicated.

2. The best position for the drainage tube is shown to depend on the immediate anatomical adjustments following the relief of pressure in the empyema, and on the factors influencing the way in which gradual obliteration of the cavity takes place.

3. Knowledge of these things may be gained by the routine pre-operative aspiration of pus and partial air replacement followed by radiological examination in various planes.

4. The position of the drainage opening is of the greatest importance if chronic cavities and secondary drainage operations are to be avoided.

The Cicely Northcote Trust was bequeathed to St. Thomas's Hospital twenty-eight years ago with the object of extending almoners' work into the wards, and making a comprehensive medico-social service for in-patients and their families before admission, while in hospital, after discharge, and in certain cases until death. The report of work done between October, 1936, and October, 1937, has recently been issued, and as in previous years contains numerous examples of the great value of the undertaking alike to patients and medical practitioners. The "follow-up" activities sometimes secure adequate nursing for in-patients who could not otherwise obtain it after discharge. Latterly, it is mentioned, there has been a closer linking in cases of malignant disease between the social and the medical follow-up work, especially for patients who have been treated with radium. Records of each case are kept, and prove to have statistical as well as clinical value. The scope of the work seems likely to extend, and further financial help is desirable. The Trust almoners are required to interview all patients admitted to the wards to discuss whether any contribution can be made towards the cost of treatment, or whether assistance is actually necessary to ease home difficulties.

TUBERCULOSIS IN INFANTS

BY

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(WITH SPECIAL PLATE)

Differences of opinion exist regarding the prognosis of tuberculosis occurring in infants during the first year of life. Many authorities consider that there can be no recovery if the disease is contracted during this early age period. Others hold that recovery is rare. Some deny altogether the existence of infant tuberculosis. With the intention of throwing light on this subject a critical examination has been made of a series of seventy-eight cases of infants suffering from tuberculosis—cases which have been under treatment during the past four years in St. Ultan's Hospital. Of these patients sixty have died and eighteen have recovered, giving a mortality of 77 per cent.

Tuberculosis as it occurs in the infant is a special study, and differences between infantile, childhood, and adult types must be emphasized. The infant gets its infection from contact with a human being in close touch with it, usually the mother; in this case the infection is repeated and often massive. Abdominal tuberculosis is rare in the first year of life; when it occurs it is as often due to ingestion of dried tubercle bacilli from floor dust as to infected milk. The main condition, therefore, which we have to deal with is inhalation infection with primary involvement of the lung. The infant shows little resistance to tuberculous infection, partly because it cannot get away from the source and so have time to acquire immunity, and partly because its defence capabilities in general are low during these early months of life. Inherited immunity may be regarded as negligible so far as tuberculosis is concerned. The picture of infantile tuberculosis is that of a non-healed primary (Ghon) focus in the lung, and the greatest danger is that this will develop into acute miliary tuberculosis of the lung or into meningitis. Of the three stages of tuberculosis (primary complex, generalized haematogenous spread, and isolated bronchogenic phthisis) we find in infants the first stage, characterized by tremendous glandular enlargement, merging rapidly into the second stage, which in its turn is characterized by involvement of the meninges or of the lung by miliary spread. If a cavity is present in an infant it is due not to third-stage bronchogenic spread but to the breakdown of the primary focus, perifocal caseous pneumonia, and cavity formation at the site of the primary focus. Cavities, caseous and confluent caseous pneumonia, meningitis, and acute miliary tuberculosis are all fatal under the age of 1 year. Children up to 3 years old who are infected by the tubercle bacillus will show a somewhat similar but modified picture, and recovery during the primary stage is the rule rather than the exception. After the age of 3 infection becomes much less tempestuous, for the glandular defence is more successful in stopping fatal blood-stream spread; in spite of the danger of involvement of bone, joint, eye, kidney, etc., the primary complex heals in many cases without metastases. In later childhood, in addition to secondary metastases, the adult type of phthisis may be seen.

It may be asked how we knew that these seventy-eight infants were suffering from tuberculosis and not from "marasmus." It is generally accepted that a positive tuberculin skin test in an infant indicates an active lesion. Secondly, sixteen consecutive necropsies performed at the outset of the investigation provided a criterion for the interpretation of radiographs in subsequent cases. Thirdly, a history of contact in the home was forthcoming in 70 per cent. of cases.

Analysis of the Fatal Cases

Of the sixty patients who died twenty-three were infected before they were 6 months old. The sexes were evenly divided. The following conditions were involved:

Pulmonary Tuberculosis (22 cases; 5 necropsies).—In these there was no attempt at healing in the primary focus. Localized caseous pneumonia and occasionally cavitation were observed. Duration two to three months. Broken-down primary focus.

Miliary Lungs (18 cases; 5 necropsies).—Including millet-seed acute miliary and confluent caseous pneumonia affecting both lungs; abdominal organs frequently involved. Primary focus indiscernible. Duration two to three months. Second stage, haematogenous spread.

Tuberculous Meningitis (17 cases; 4 necropsies).—All following a pulmonary lung infection; primary focus seen in fourteen cases by radiography (three were not radiographed, but one was seen post mortem). Duration one to two weeks. Second stage, blood-stream infection.

Abdominal (2 cases; 1 necropsy).—One secondary to localized lung lesion (swallowed sputum). One with lungs free, fed on milk of one tuberculin-tested cow; mother had open phthisis; ingestion from floor dust.

Congenital Tuberculosis (1 case; 1 necropsy).—Primary focus in the liver; entry via the umbilical vein from placenta of phthisical mother.

Table showing Site of Primary Focus

Zone	Deaths		Recoveries
	Pulmonary Tuberculosis	Meningitis	Primary Tuberculosis
Right upper ..	12	3	7
Right lower ..	5	2	5
Left upper ..	4	8	3
Left lower ..	1	0	0
Glands only seen	0	2	3

Table showing Contacts of Cases

	Deaths	Recoveries
Mother	19	9
Father	9	4
Uncle, aunt, brother, etc. ..	9	5
Not elicited	23	—

Fifty-seven deaths, then, occurred from inhalation infection, either with caseous pneumonia due to non-healing of the primary focus or in the stage of haematogenous dissemination. All these infants were seen only after the first stage had passed, with the exception of two who were admitted in the primary stage but in whom the focus broke down during an intercurrent infection (whooping-cough and Vincent's angina). A few days after admission it was possible to give a hopeless prognosis to the parents of fifty-five of these patients. By the comparison of post-mortem and *x*-ray findings data were provided for earlier diagnosis of tuberculosis of the lungs, and it was recognized that any hope of effecting a cure depended on diagnosis during the primary stage, before caseous pneumonia or blood-stream dissemination had set in. It is essential that healing of the primary focus be ensured; for in the

infant hypersensitivity is markedly disproportionate to the weak glandular defence. The invasion of the tubercle bacillus and the swamping nature of its course, unopposed in the infant, may lead to death within a few weeks of its first entry. Thus it would appear that all hope of cure depends on early recognition of the infection, followed by immediate removal of the infected infant from further contact. "Early" means before physical signs are established: to be on the safe side all doubtful cases should be treated as positive until the contrary is proved.

Analysis of Cases that Recovered

The eighteen patients who recovered were in the primary stage of pulmonary tuberculosis; eight were under 6 months old when first observed. All had definite radiological appearances, all had a history of family contact, and all were positive to the tuberculin skin test. Regarding the tests, twelve were positive to the percutaneous test, and the six who were negative to it proved positive to a second test—namely, a stronger dilution given intracutaneously. The position of the recovered cases to date is as follows: twelve are completely healed radiologically and are clinically well—two for a period of four years, four for three years, five for two years, one for one year; and four are still under observation but have been healed for six months. The remaining two are still in hospital after three months' treatment; their radiographs are now clear, they are gaining weight rapidly, and there is no reason to think that they will not heal completely.

Diagnosis

In these cases diagnosis was made on three grounds, and three grounds alone—namely, the tuberculin skin test, the chest skiagram, and contact history. Each case underwent repeated physical examinations, which provided no definite information; indeed, the results were often misleading. The conclusion at which I arrived was that the more one hears in an infant's chest the less likely it is to be due to tuberculosis. There is no cough as a rule, but pressure of glands on the trachea will sometimes produce a barking hoarse cough with an expiratory whoop which may be confused with pertussis. Some slight dullness on percussion and diminution of breath sounds on auscultation may be present if the infiltration is heavy, but otherwise the primary stage is silent. The later stages are also characterized by absence of physical signs. Vomiting (caused by swallowed sputum) and anaemia are sometimes present, and there is no increase in weight. Fever is usually absent.

The Tuberculin Skin Test.—This test is invaluable in detecting the primary stage. A weak dilution must always be tried first, as the infant may be hypersensitive to tuberculin. If negative the test should be repeated once a week, for the reason that an incubation period of six weeks from the entry of the bacillus must pass before the establishment of allergy, which is manifested by a positive test. The preliminary test in this series was by means of Hamburger's percutaneous ointment, which is equivalent in strength to a dilution of 1 in 1,000 intracutaneously. If this was negative, four days later 0.1 c.cm. of a 1 in 100 dilution Mantoux was injected intracutaneously. It is sometimes difficult to elicit a response in an infant under 6 months old. At times also it is not easy to get a positive response in tuberculous meningitis or advanced miliary tuberculosis, but the 1 in 100 Mantoux is usually successful.

Radiology.—The use of radiology is essential, but we must know what to look for in the film, and our interpretation must be guided by the tuberculin test. We seek a primary focus in the lung field, an infiltration, and enlarged mediastinal glands. The primary focus may be concealed in the infiltration, and it is not easy to decide whether this is an infiltration of the primary stage or a caseous pneumonia: the prognosis is very different in the two. The glands involved may belong to the hilar or paratracheal groups, or both; the glands may be seen with the primary focus, or alone if the latter is small and invisible by *x* rays. Sometimes the glands do not appear as discrete entities, but as a ribbon shadow on either side of the trachea (Fig. 1 on Plate): in this case the shadow is caused by vessels which are displaced by glands; the error of taking the film during the phase of full expiration will give a false impression of a ribbon shadow. Transitory enlargement of hilar glands occurs in bronchitis and pneumonia, but a negative skin test and repeated radiographs will settle this point. Lateral views are useful in showing up the bifurcation glands. In infants one must not look for calcification, and healing by fibrosis will not produce the striation seen in adult films. The primary infiltration involves part or all of a lobe, or even a whole lung, in an infant. It may disappear in a short time, but it can remain for over two months. Its nature is that of a non-caseous exudation. The shadow seen in cases of epituberculosis lasts much longer than two months, and is, on the whole, somewhat denser, which is to be expected if this transitory tissue reaction, which is without caseous changes, is accompanied, as is often the case, by atelectasis due to occlusion of a bronchus by plugging or by compression. None of the above series showed epituberculosis clinically, radiologically, or at necropsy: the condition appears to occur more frequently during the second and third years, as well as in older children.

History of Contact.—It is most important, especially when a parent is involved, to obtain the contact history. This matter has been dealt with fully by Gregory Kayne in his exhaustive article "Tuberculosis in Home Contacts" (*British Medical Journal*, 1935, **1**, 692). But chance infection also plays a part. A newborn twin in a maternity hospital was lent by the nurse to comfort a woman who was very ill and had lost her own baby. This baby, aged 16 days, was sent to our hospital as "delicate," and he died of miliary tuberculosis of the lungs when 6 months old: the other twin and the rest of the family were free from tuberculosis. In the accompanying contact table the twenty-three cases where no history was elicited were not investigated personally, so I cannot vouch for them as having no history; it may have been a remote one.

Prognosis

When the diagnosis is made in the primary stage prognosis is favourable provided that the infant is immediately removed from contact. Protection from intercurrent infection is also most important. The prognosis is fair when the primary infiltration is localized and the hilar glands only are involved: then the tuberculous process will probably heal, but if the baby is very young no certain prognosis can be given. The prognosis is much less favourable when the lung shows a widespread infiltration or when a caseous pneumonia is commencing, or if there is massive involvement of the paratracheal glands. Infection of the paratracheal glands rings a note of grave warning, for at any moment these glands may discharge their content of tubercle bacillus into the blood stream: this takes place via the thoracic duct, and leads to generalization and metastases. Nevertheless removal from contact, with

hospital treatment, may result in cure even in such apparently dangerous cases (Plate, Fig. 2). Prognosis depends entirely on the stage at which diagnosis is arrived at, and thus every effort must be made to search out these cases and to recognize at a very early date the fact that they have been infected. The primary infection will show no clinical signs typical of the condition, and diagnosis can only be made on the grounds already mentioned.

Treatment

First and mainly treatment consists in removal of infants from all possible tuberculous contact. They should not be put in sanatoria where there are cases of open phthisis. They should be taken to infant hospitals or preventoria, and the isolation must be maintained until healing is evidenced by calcification or by fibrosis. Calcification is the less usual end-result, because if infants have caseating foci there is nearly always a fatal termination. Fibrosis is the commoner end-result; and here in later radiographs nothing abnormal is seen, and the only proof of past infection is the serial radiographs and a positive tuberculin test. Healing is established in mild cases in six months, but other cases may take up to two years. The falling of the sedimentation rate to normal also indicates healing. The second essential of treatment is rest in bed. Movements in the cot have to be permitted, but exercise out of the cot must be postponed until serial radiographs and normal sedimentation rate and weight gain show that the lung is healed. Fresh air is essential throughout treatment, but infants must not be exposed beyond their limits of endurance, and throughout treatment they must be kept warm. Digestive disturbances must be attended to and a suitable diet rich in vitamins, with added calcium, must be given. Ultra-violet rays and strong sunshine are absolutely contraindicated in all pulmonary lesions in infants and children; however, in these climates outdoor shade in summer and exposure to sun in spring and autumn are safe. Temperature charts, the sedimentation rate, and radiographs all demonstrate how dangerous is sun-bathing to a small child with a pulmonary lesion, be this only in the primary stage. It will be found that casualties occurring during the primary stage of pulmonary tuberculosis will be among those infants whose parents are not convinced, and who do not allow this treatment to be carried on until complete healing has been ensured.

Summary

1. Seventy-eight cases of tuberculosis of the lungs are reported in infants under 1 year old: 23 per cent. recovered.

2. Healing can only be achieved by early diagnosis—that is, in the primary stage.

3. Early diagnosis can only be made by tuberculin skin test, radiography, and history of contact.

4. Treatment consists mainly in immediate removal from contact and in rest.

D. Bobeff (*Mschr. Kinderheilk.*, October 8, 1937) records the case of a Bulgarian girl, aged 10, who on the sixteenth day of a severe attack of faucial diphtheria, six days after the onset of palatal palsy, developed gangrene of both legs, most marked on the right side. The necropsy three days later showed thrombosis of the abdominal aorta, multiple infarcts in the left kidney, gangrene of both feet, and myocarditis. Bobeff has found only two other cases on record of occlusion of the abdominal aorta following diphtheria.

AN UNUSUAL TUBERCULOUS APPENDIX

BY

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AND

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(WITH SPECIAL PLATE)

Although tuberculosis of the appendix is not an uncommon disease it is still the exception for it to be mentioned in standard textbooks of medicine or surgery. It has been stated that from 1 to 3 per cent. of all appendices removed at operation are tuberculous. It is obvious that an investigation into this problem at a large hospital would entail an enormous increase in the microscopical work of the institution, and this might be regarded by the pathologists as out of proportion to its value. An investigation carried out by Pagel and Weichherz (1936) at Papworth Village Settlement, based on eighty-four necropsies on tuberculous subjects, showed that roughly one-third had no intestinal tuberculosis; another third had intestinal tuberculosis with no involvement of the appendix; the remaining third had involvement of both the intestine and the appendix. In three cases the appendix was the only part of the gut to be involved, and in each there was extensive tuberculosis in the lungs.

The appendix is almost always involved in ileo-caecal tuberculosis. It is generally recognized that tuberculosis may primarily involve the intestines, but it is not so certain that the appendix alone can be the site of tuberculosis. In view of the above remarks it requires some courage to suggest that the case described below is one of primary tuberculous appendicitis, successfully treated by operative removal, with the patient alive and perfectly well nearly two years later.

Case Record

On March 18, 1936, a marine engineer, aged 19 years, had a slight attack of abdominal pain lasting about an hour. It was so mild that the patient did not trouble to obtain medical attention, and in fact went on with his work. On March 23 he had a recurrence of the pain, and when seen by one of us (E. W.) was sent into a nursing home with the diagnosis of acute appendicitis. On admission the temperature was 104° and the pulse 90. There was very little rigidity but some tenderness in the right lower abdomen. On account of the comparative absence of rigidity it was possible to palpate a large tubular structure, about an inch in diameter, running from the right iliac fossa into the pelvis. It felt like an indurated coil of intestine or an intussusception. The patient and his mother were quite definite that he had never been ill before.

Operation.—This was carried out within three hours of the onset of symptoms by D. J. H., the anaesthetic being given by E. W. On opening the abdomen it was seen that the tumour was an enormously enlarged appendix, its peritoneal coat being dark red. It felt perfectly solid and hard, and there was no constriction at its junction with the caecum. After ligating its mesentery the appendix was removed intact and the raw area left on the caecum covered over by making use of the ileo-caecal fold of peritoneum. There was some induration of the wall of the caecum for about half an inch beyond the actual area to which the root of the appendix was attached, and if the tuberculous nature of the appendix had then been known this area would have been resected.

Subsequent Progress.—The patient made a rapid recovery, the temperature falling two degrees a day, and was normal on the third day. It is curious that the pulse never exceeded 90 at any time during the illness. The incision healed by

first intention and the patient went home on April 8, a fortnight after the operation. He has been seen and examined several times since. In February, 1937, he served as second engineer on a trip to the East, and returned in June. He was then carefully examined by us, but nothing abnormal could be found in the chest or abdomen. In fact he felt and looked perfectly well.

The Specimen.—Before hardening in formalin this was six inches long and one inch in diameter, and slightly curved. It was quite solid and hard, with a small black spot representing the original lumen. The cross-section at the root was greyish pink, with no evidence of necrosis or suppuration—in fact, the only sign of inflammation was in the peritoneal coat, which was dark red. The specimen, which has been placed in the museum of the Royal College of Surgeons, is now smaller and the colour of the peritoneum has faded. Fig. 1 (see Plate) shows the size and shape after hardening and mounting. Fig. 2 gives the microscopical appearance of a section taken from the cut surface at the root. A few giant cells can be seen in a mass of lymphoid tissue. The various layers normally found in the wall of the appendix have been completely replaced by tuberculous tissue, the peritoneum alone having survived.

Comments

It is unnecessary to state that the exact nature of the change in the organ was not realized until the microscopical slides were examined. The specimen was unlike any appendix we had seen previously. It is obvious that the disease must have started months, if not years, before it was discovered. The absence of symptoms until within three hours of operation allowed us to remove the specimen before it had been damaged by inflammatory processes. We are of the opinion that the acute symptoms were caused by interference with the blood supply, as there was no visible lumen which could have been infected. At the operation the other abdominal organs were looked at in the ordinary way, but nothing abnormal was found. It must be admitted that small tuberculous lesions were not specially sought, as the diagnosis of tuberculosis had not then been suspected. But in view of the subsequent history of the patient it is reasonable to assume that there could not have been any well-developed tuberculous changes in the intestines or lungs. He returned to work in a few weeks, and has since enjoyed perfect health.

We are indebted to Mr. W. J. Salter, technician to Llandough Hospital, for the photographs.

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La Migraine Ophtalmique, by Drs. G. Renard and A. P. Mekdjian (the publishers are Masson of Paris and the price is 22 francs) gives a convenient summary of what is known of migraine, well set out under carefully designed subheadings. No unifying conception emerges, the authors stressing the multiplicity of associated disturbances, and dealing in particular with the allergic basis of the affection. One point of interest which they bring out is the disturbance in blood pressure, which they studied both from the general aspect and by ophthalmodynamometry of the retinal vessels. In general they found a tendency to hypotension during the attacks. Their thesis is illustrated by some case reports. They argue that hypotension can be taken as a diagnostic feature distinguishing true migraine from the transient blotting out of vision seen in elderly people with hypertension. They regard migraine as a condition which, though distinct from epilepsy, has in common with it the fact that there is a widespread, though ill-defined, underlying general departure from the normal, both psychological and somatic.

PELVIMETRY AND THE TRUE CONJUGATE

BY

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Every obstetrician must from time to time have been asked to see ante-natal cases in which a practitioner or midwife has felt on vaginal examination the sacral promontory; and there must be a number of women who are, because of this genuine misconception, submitted to unnecessary obstetric operations, with a diagnosis of gross pelvic contraction.

While not decrying the academic importance of attempting to measure the true conjugate clinically, it is the purpose of this brief communication to draw attention to the extreme rarity with which the sacral promontory can be palpated per vaginam; and my excuse for burdening an already adequate literature is that in the course of the last twelve months' ante-natal work three cases have been referred to the Middlesex Hospital Ante-natal Clinic labelled with such a phrase as: "Sacral promontory felt per vaginam: ? Caesarean section for pelvic contraction." All three were subsequently delivered by the natural passages. The only explanation that answers this fallacy is that the "sacral promontory" is in reality one of the lower bodies of the sacral vertebrae.

Three Factors to be Considered

Whether or no the sacral promontory is palpable depends on three factors: first, the length of the true conjugate; secondly, the effective length of the examining finger; and, thirdly, the rigidity of the vaginal introitus, which largely depends on the co-operative relaxation of the patient and her parity.

The anatomical true conjugate on the average female dry bony pelvis measures between 4.25 and 4.5 inches: the distance of the point behind the symphysis, from which the true conjugate is measured, to the subpubic angle is 1 inch on the bone, and must be nearly 50 per cent. greater than this when measured to the anterior lip of the vaginal introitus, in order to take into consideration the triangular ligament and its associated superficial small muscles and soft structures. This latter is greatest in the primipara and least in the multipara, for obvious reasons. Applying the well-known principles of geometry, the total effective length of an examining finger must be roughly 4.75 inches to feel the promontory in a normal pelvis.

The effective length of the examining finger, assuming that the index and middle fingers are used together, varies slightly with different surgeons, but surprisingly little. The determining factor here is largely the resistance encountered by the ring finger knuckle against the perineum, and to increase this useful length the perineum must be pushed upwards and backwards. Discounting this last factor, the uncompensated effective length of one's fingers is about three and a half inches. In a normal pelvis, therefore, with a true conjugate of 4.5 inches, the finger must be lengthened by depressing the perineum at least 1.25 inches before the promontory is reached, or, conversely, the pelvis must be foreshortened down to a true conjugate of 3.5 inches before the tip of the middle finger is likely to meet the posterior bony landmark. The exact location of the promontory is, moreover, a matter of difficulty, the manœuvre of sliding the finger up the

bodies of the sacral vertebrae until it is felt to recede at the lumbo-sacral angle being plainly impossible in all but a grossly contracted pelvis. The error of position of the fingers can be readily proved by attempting internal pelvimetry with radiological control, using a piece of lead in the glove tips of the index and middle fingers. The lead shadow will be seen to be well wide of the mark, even when the perineum is forcibly depressed.

The third factor is the rigidity of the perineum, and, as the type of case in which we most earnestly desire to measure the true conjugate is usually a primipara, this assumes major importance and demands an anaesthetic of reasonable depth, at least, for its removal.

Lastly, the measurement is likely to be of most use in those cases of minor contraction, and these are the very cases where, for the reasons above enumerated, it is most difficult or impossible to obtain.

Conclusion

The conclusion is that the clinical measurement of the true conjugate is either impossible to measure, or inaccurate when measured, in all but cases of severe pelvic contraction: that a genuine attempt to measure it demands in a primipara a full anaesthetic; that the location of the sacral promontory requires practice and skill and is valueless unless performed by one well versed in pelvic examination; and that the measurement, when truthfully obtained, is open to considerable experimental error, in addition to errors due to the particular anatomy of a given patient, such as the depth and inclination of the symphysis.

WHY "POST-ANAESTHETIC" PULMONARY COMPLICATIONS?

BY

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That the great majority of "post-anaesthetic" pneumonias are "post-anaesthetic" in time relation only is no longer open to doubt. Inhalation anaesthesia does not predispose to pneumonia unless there is pre-existing lung disease. The typical post-anaesthetic pneumonia is the result of many minute pulmonary emboli from the operation site, and so is slightly commoner after local than after general anaesthesia. Its most important causes are trauma, mobility of the affected part, and sepsis (Cutler and Hunt, 1922). The control of "post-anaesthetic" pneumonia is thus mainly in the hands of the surgeon, not the anaesthetist. The term is therefore deplorable, because it diverts attention from the real causes and possibly suggests negligence on the part of the anaesthetist.

Aspiration of Foreign Matter in the Trachea

Very interesting observations on the ease with which matter such as blood and mucus enter the trachea have been made by M. C. Myerson (1922); he demonstrated it in 76 per cent. of patients who had had a tonsillectomy under light general anaesthesia, a cough reflex being present. Ochsner and Nesbit (1927) made an even more striking demonstration by placing lipiodol in the mouth of patients who had local anaesthesia of the tonsillar region. Radiographs taken later showed that lipiodol had passed into the lungs in every case. The same thing happens readily in patients who have pharyngeal anaesthesia as a result of disease.

AN ILLUSTRATIVE CASE

Recently I made a necropsy on the body of a woman of 65 who drowned as a result of taking a cup of tonic (sanatogen) directly into the trachea. A small amount of fluid had entered her trachea on many previous occasions; she was known to have a syphilitic paralysis of the palate. Her body was slightly wasted and cyanosed; the blood was dark and fluid; she had a syphilitic aortitis and aortic regurgitation. There was no obvious pre-existing lung disease. The bronchi were filled with a whitish frothy emulsion, which was not readily distinguishable from pus by the naked eye. Microscopically its nature was clear, but a considerable amount of the sanatogen had been taken up by phagocytic cells. Routine sections showed no bronchopneumonia. There was no post-mortem evidence of the many small amounts of foreign matter which had entered her trachea on previous occasions.

It therefore seems certain that the cough reflex fails as a mechanism of expulsion under light anaesthesia; also that blood and mucus do not appear able to provoke pneumonia by themselves. It is not suggested that foreign matter can enter the lungs with impunity, for that is obviously not so. A typical example of this was a woman of 46 who was rescued from a suicidal attempt in a canal recently. She was resuscitated fairly easily, and was hysterical when admitted to the Derbyshire Royal Infirmary. For some hours she made good progress, but pulmonary oedema developed and she died about thirty hours after jumping into the canal. At necropsy I found a simple acute inflammation of the larynx and trachea, generalized pulmonary oedema, patches of red hepatization indicating early bronchopneumonia, no evidence of pre-existing lung disease, and a normal heart. In this case the cause is clear: it was neither "post-anaesthetic" nor due to embolism. Such cases are not rare, and they serve to emphasize the danger of regarding complacently the blood and mucus which enter the trachea far more readily than most of us realize.

General Anaesthesia as a Cause of Lung Abscess

The role of general anaesthesia in the aetiology of lung abscesses after tonsillectomy has been variously estimated. The usual belief is that the condition is commonest after open general anaesthesia and rare after intratracheal ether or other types of general anaesthetic in which special care is taken to prevent foreign matter entering the trachea. The average incidence is probably 1 in 2,500 tonsillectomies (Moore, 1922), but figures vary from 1 in 358 (Glowacki, 1923) to 0 in 20,000 (Lyman, 1923). A. L. Lockwood (1923) found that out of 208 lung abscesses 201 followed general anaesthesia. M. Manges (1916) noted that lung abscesses were commoner after operations with the patient upright. J. Maxwell (1934), in an exhaustive study, however, finds that the main association is sepsis in the operation field, and favours an embolic origin: such a view frees the anaesthetic from both direct and indirect blame. He also notes that lung abscesses are commoner after tonsillectomy than after dental operations. I have recently made two necropsies which throw some light on the problem.

TWO ILLUSTRATIVE CASES

Case 1.—An emaciated boy of 4 years had a lower left molar tooth removed on October 2. An abscess about five days old was present. The anaesthetic used was an ethyl chloride spray, and the boy did not lose consciousness. He

died nine days later. There was a foul osteomyelitis of the left side of the jaw, pus from which extended into the cellular tissues of the neck, but no mediastinitis was found. The lower lobes of both lungs were almost completely solid from a very large number of small abscesses. In the left upper lobe there was a broken-down abscess three-quarters of an inch in diameter, which may have been older than the others. The pus in all the abscesses was very foul. No tooth fragment could be found though a careful search was made, and this would have been a relatively easy case in which to discover it had it been present. The heart and other organs were normal. It appeared clear from the distribution that these abscesses were the result of inhaled septic matter. It is possible that the basal abscesses were secondary to the one in the left upper lobe, but the history does not support that suggestion. It is difficult to imagine an anaesthetic less likely to favour inhalation of septic matter than a brief ethyl chloride spray. The boy was reasonably well for several days, and then his mouth began filling up with pus, which was very offensive, but which he could not be persuaded to spit out. He almost continually had his mouth full of it, and so there must have been many occasions on which it entered his trachea. The dentist and the anaesthetic were naturally exonerated in this case.

Case 2.—On May 11 I made a necropsy on the body of an elderly woman. A tooth fragment was found in the middle of the right lower lobe of the lung. There was no surrounding abscess, but a diffuse acute pulmonary oedema was present, with blood-stained froth in the trachea and bronchi. This had presumably been caused by the irritation of the tooth, for the heart was normal. She had, however, a rather severe chronic nephritis. In this case the coroner also exonerated the dentist and anaesthetic—there had not been either. The patient had suffered with bad teeth for some years, and parts were frequently breaking off (this was learned after the necropsy). She had resolutely refused to go to a dentist because she was frightened. Her husband left her in apparently good health, and when he returned two hours later she was lying dead on the kitchen floor. The cause of her death was a mystery until the necropsy was made. The tooth fragment was not an embolus, of course; and these two cases show the ease with which foreign matter can enter the trachea in the complete absence of anaesthesia.

Summary

1. General anaesthesia by itself is of very little importance in the aetiology of post-operative lung complications.

2. Aspiration of foreign matter into the trachea and bronchi occurs with surprising ease and frequency.

3. Lung complications have been reduced by attention to the causes of embolism (operative trauma, mobility of the affected part, and sepsis) and great care in preventing the aspiration of foreign matter into the trachea.

4. It is probable that embolism and aspiration are both important causes of post-operative lung lesions and that neither alone can explain all cases.

I am indebted to the coroner for Derby, Captain T. H. Bishop, O.B.E., for permission to publish notes on the necropsies recorded, all of which were made on his instructions.

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CHLOROMA

A CASE HISTORY AND POST-MORTEM FINDINGS

BY

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Chloroma is a disease of particular interest, not only on account of its rarity but also because of its somewhat dramatic clinical course and the fact that it is considered to occupy a position intermediate between the leukaemias on the one hand and neoplasms of the marrow on the other hand. The number of authenticated cases reported in medical literature is small. Roehm, Riker, and Olsen (1937) state that up to the end of 1936 they amounted to only 194, and this figure is probably accurate, since the majority of cases presenting such a severe clinical syndrome as is characteristic of chloroma would, at some phase of the disease, be under hospital supervision and the diagnosis recorded. All these cases proved fatal with the exception of two, in which recovery is said to have occurred following operative removal of the primary tumour.

The aetiology remains obscure. There is a tumour-like hyperplasia, probably of the leucocyte parent cells, occurring primarily in the red marrow. Authorities differ as to whether the tumour cells should be considered myelocytic or lymphocytic: most cases appear to belong to the former category. In the present case the cells in the marrow and substernal tumour showed the presence of oxidase granules when stained by the Goodpasture technique, but they also showed the presence of a dense nuclear membrane which is not typical of the myeloblast. Roehm, Riker, and Olsen report a case in which the cells were too primitive to be labelled either myelocytic or lymphocytic.

Case Record

A girl aged 17, a laundress, was admitted to hospital on September 11, 1937, suffering from general weakness and protrusion of the left eyeball. Ten weeks previously she had had an attack of vomiting lasting three days and pains of neuralgic type in the left side of the face. She was becoming pallid, was easily tired, and developed diplopia.

Clinical Examination.—The patient was grossly anaemic but well nourished, with no jaundice or oedema; the left eyeball showed well-marked exophthalmos, being also dislocated downwards and outwards. The temperature was 100.5° F. The heart rate averaged 115 to 125; the apex beat was displaced half an inch to the left; and the first sound was reduplicated and accompanied by a short mitral bruit. Examination of the lungs revealed no anomaly except unduly harsh breath sounds and scattered rhonchi; there were no moist sounds and no signs of pleural effusion. The abdomen was normal, neither liver nor spleen being palpable. The nervous system was normal, but the ocular fundi showed bilateral papilloedema, scattered haemorrhages, and occasional patches of exudate. Palpation of the left supra-orbital margin revealed a moderately hard mass on the nasal side. Pressure along the sternum showed a positive Craver's sign—that is, tenderness at the level of the fifth costal cartilage. There was some deafness on both sides, but this was of middle-ear type.

Special Investigations.—The first blood count gave the following figures: haemoglobin, 25 per cent.; red cells, 1,080,000 per c.mm.; colour index, 1.3; white cells, 60,000, containing 43 per cent. myelocytes and 9 per cent. myeloblasts. Later counts showed that the white cells remained

fairly steady but there was a gradual increase in myeloblasts. The clotting time was 7.5 minutes (normal 5 minutes), and the bleeding time 14 minutes (normal 1–3 minutes). Albumin was occasionally present in the urine, and the excretion of uric acid was increased from 40 mg. to 59 mg. per 100 c.cm. Films prepared from material obtained by sternal puncture showed eosinophil and neutrophil polymorphs and myelocytes, but the most prolific cell seen was about twice the size of a red cell, with a large, rounded, pale nucleus and non-granular cytoplasm. Repeated stereoscopic radiographs of the skull showed no periosteal reaction in the affected orbit, even when the tumour had attained considerable size. Films of the thorax revealed no bony changes in the ribs or sternum, and the lung fields were clear apart from slight increase in the bronchial markings.

TREATMENT

Treatment was undertaken in a spirit of pessimism. In view of the blood count the patient was given weekly injections of 3 c.cm. of Lilly's liver extract (conc.), and a mixture of ferri et ammon. cit. 20 grains with liq. arsenic. 3 minims, three times daily. It was thought that copper might be a helpful medicament both for its synergic action with iron in influencing the anaemia and also for its supposed anti-malignant effect. The patient was therefore given 3 c.cm. of Crookes's collosol cuprum intramuscularly three times in the first week and thereafter once weekly.

On September 24, as the haemoglobin had dropped to 15 per cent. and the patient's general condition was critical, she was given a transfusion of 1,000 c.cm. of whole blood, and there was a rapid general improvement. The next day the spleen was palpable for the only time during the illness. On October 23 *x*-ray therapy was commenced, directed to the orbital tumour. The radiologists give the following details: 300 *r* daily for five days; factors, 200 kV 8 mA, filter 1 mm. Cu plus 1 mm. Al; focal skin distance, 50 cm.; field, directly over orbit, 7.5 cm., round cone. Although the orbital tumour decreased in size the patient's general condition gradually deteriorated, and she died on November 1.

POST-MORTEM EXAMINATION

The pericardial sac contained fluid in the form of greenish foam. The endocardium showed a thrush-breast appearance. The spleen measured 8 in. by 4 in. and was normal in appearance. The kidneys measured 6 in. by 3 in. and exhibited dark macular areas. The ovaries were normal in size but bright green throughout. There was free fluid in the peritoneal cavity, and there were very numerous enlarged mesenteric glands; the liver surface showed small green areas, and on section a typical nutmeg effect was seen. The pancreas showed numerous green areas. The brain was normal, but there was considerable extradural and intradural fluid. The adrenals appeared normal. The orbital tumour was a green mass, about the same size as the eyeball, and was attached to the bone. The whole of the posterior surface of the sternum was covered by a thick mass of green tissue.

Pathologist's Report

I am much indebted to Dr. F. B. Smith of Preston for the following detailed report:

NAKED-EYE APPEARANCES

1. *Eyeball.*—With all contents of socket. At one side is a thick disk of green tumour 1½ by 1½ by ½ in. with fragments of bone adherent to its outer surface. Consistence of tumour even and elastic, like that of the sternum.

2. *Sternum and Rib Cartilages.*—Whole of posterior surface of sternum covered by flat yellow-green tumour, of uniform consistence, rubbery, and a quarter of an inch thick; smooth even surface. Extends slightly into the rib cartilages. There is a similar but smaller flat tumour over the lower half of the front of the sternum. The periosteum is part of the "neoplasm," which strips smoothly off the bone.

3. *Piece of Heart Muscle.*—Shows a few petechiae on the outer surface.

4. *Piece of Liver.*—1 by 1 by 1½ in. Pale brown with distinctive yellow mottling.

5. *Wedge of Spleen.*

6. *Piece of Kidney.*—Transverse slice of one-half of a kidney half to one inch thick, capsule absent; surface slightly nodular, some elevations red, others yellow-green.

7. *Slice of Pancreas.*—Shows small green patches.

8. *Appendix.*—Four inches long, normal external appearance.

9. *Ovarian Cyst.*—Opened. Flat diameter 1½ inches. Inner lining pea-green, and patches of the same colour on the outer surface.

10. *Mesentery.*—Contains one calcified gland and many small glands. Faint green colour in patches in the connective tissue but not in the glands.

11. *Chain of Abdominal Glands.*—Marked hyperaemia and bright green colour of all surrounding connective tissue.

12. *Shaft of Femur: (1) Split, (2) Unsplit.*—Six inches. Marrow uniformly red. The sawdust is distinctly green.

HISTOLOGICAL NOTES

1. *Orbital Tumour.*—The sample contains a large lobule of lachrymal gland, embedded in fibrocellular and fatty tissue. The "tumour" has a fairly rich supply of blood capillaries. There is cellular infiltration of the fibroblastic tissue, mainly diffuse, evenly distributed, but with isolated closely packed columns of cells between fibrils of stroma. The cells are of widely varying shape but uniform size of about 10 to 15 microns; spherical or polygonal, with more nuclear substance than cytoplasm. The cytoplasm is non-granular when stained with haemalum and eosin. The nuclei vary widely in shape, being spherical, elongated, and slightly folded, or bilobed, or double; the nuclei are hyperchromatic and show coarse granules and strands of chromatin. Nucleoli are not seen. The design under the low power is diffuse fibrosis, with moderate and diffuse infiltration by cells indicated. These cells invade freely the interacinar stroma of the lachrymal gland.

Orbital Plate.—Attached to the outer surface of the orbital tumour is a thin plate of bone. This, after decalcifying, shows cellular design and features the same as the above, though fibrosis is greater and bony trabeculae are thin and widely spaced.

2. *Sternal Tumour.*—This is a densely cellular lesion—a closely packed mass of infiltrating "chloroma" cells, compressed between a thin superficial capsule and the bone surface. Stroma is scanty, but is visible between layers of cells only one cell thick. The periosteum is only recognizable by detached flakes of bone. In capillaries is a dense aggregation of undistorted cells, resembling those seen in films of the blood taken before death. Fresh films of sternum tissue stained for oxidase by the Goodpasture technique show a considerable proportion of large mononuclear cells giving a positive reaction.

3. *Heart Muscle.*—Many capillaries are packed with "chloroma" cells, which also are thinly scattered in interfibrillary spaces, with a few small perivascular aggregations.

4. *Liver.*—Gross fatty change, with survival of thin bands of parenchyma in the periphery of lobules. Widespread permeation of sinuses and perivascular portal sheaths with "chloroma" cells.

5. *Spleen.*—General design preserved: for example, Malpighian nodes are prominent, numerous, and of normal cellular structure; but the pulp is densely packed with "chloroma" cells.

6. *Adrenal.*—Normal except for a few "chloroma" cells visible in capillaries of the connective-tissue capsule.

Kidney.—The naked-eye view of a section of kidney is distinctive because of prominent dark superficial areas. These are deposits of "chloroma" cells embedding tubules and glomeruli.

7. *Pancreas.*—The interlobular and interacinar stroma is almost wholly "chloroma" cells.

8. *Appendix.*—"Chloroma" cells constitute the interglandular stroma of the mucous membrane and the submucosa. Normal lymph follicles are preserved.

9. *Ovary.*—Converted into a solid "leukaemic" tumour; thickly scattered are aggregations of brown-yellow pigment, both coarsely granular and homogeneous. Normal ovarian stroma is inconspicuous. The interstices of the vascular pedicle are thickly infiltrated by "chloroma" cells.

10. *Mesenteric Gland.*—8 by 10 mm. Preservation of normal peripheral ring of follicles. Central pulp densely infiltrated by "chloroma" cells.

11. *Abdominal Gland.*—Enlarged, 25 by 15 by 10 mm. Contains active tuberculosis. Peripheral lymph nodes preserved, but the pulp, vascular pedicle, and external connective-tissue bed are solid leukaemic tumour.

12. *Femur Marrow.*—Paraffin section stained with haemalum and eosin. The main feature is dense cellularity, with very few fat spaces and an absence of the design of normal marrow. The predominant cell is distinctive, 12 to 20 microns, with large nucleus, mostly round, many slightly curved, some more curved or bilobed. The nuclear membrane is thick and prominent; some nuclei have dense large granules of chromatin, many are pale and vesicular; one, two, or three pink nucleoli are frequent. The cytoplasm is faintly basophil, and non-granular. Primitive erythrocytes are very scanty. Normal eosinophil and neutrophil granular cells, both primitive and mature, are moderately plentiful, but typical normal lymphocytes are absent. A few granular aggregations of golden pigment are present outside cells. A fresh film of marrow, stained for oxidase by the Goodpasture technique, shows that most of the large mononuclear cells give a marked positive reaction.

In the visceral deposits there is marked compression and distortion of the infiltrating cells by tight packing. Mitoses are frequent among the "chloroma" cells. Coarsely granular eosinophil leucocytes are present in most of the leukaemic deposits.

Discussion

In such a case as this there appears to be an uncontrolled stimulation to undisciplined multiplication of the myeloblasts or their parent cells. Whether such stimulation is due to some unknown infection or is a primary malignant change in the myeloblastic tissues remains in doubt.

The histological findings indicate, as one would expect from the clinical course, that chloroma is a much less benign disease than leukaemia. In the latter condition the tissues are infiltrated by the specific cells in a manner which may be described as a peaceful colonization; in chloroma, on the other hand, the tissues are invaded by an aggressive militant force with malignant potentialities, as shown by the frequent findings of active mitosis and the formation of tumour masses. The periosteum appears to be the most vulnerable part of the defence line, for here the attacking force makes most progress with the development of neoplasms.

I wish to express my thanks to Dr. W. Hayes, Dr. A. St. Clair Robertson, and Dr. F. B. Smith of Preston for their kind collaboration in this case.

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Clinical Memoranda

A Case of Chloroma

(WITH SPECIAL PLATE)

This case of chloroma is recorded on account of the rarity of the condition.

CASE REPORT

History.—A boy, aged 6 years, was admitted to hospital on September 6, 1937, with marked double exophthalmos. He had complained of headache for the last month, previous to which he was in perfect health. Twenty days before admission the parents noticed protrusion of both eyes, which gradually increased until it became very marked. They also noticed that the boy's vision had not failed. On examination the most striking thing observed was the extreme double exophthalmos with oedema of the conjunctiva and a left corneal ulcer due to lagophthalmos. The patient was also greatly emaciated. The skull was big in proportion to the body, and a fairly large swelling at the right angle of the lower jaw and a smaller one at the left angle were present. There were greatly dilated veins over the scalp and forehead. The lymph glands of the neck were somewhat enlarged and discrete, but there was no enlargement of the axillary or inguinal glands. The circulatory and respiratory organs did not show any abnormality. The liver was three fingerbreadths below the costal margin, and the spleen was fairly big, reaching to half-way between the costal margin and the umbilicus. The temperature was 37° C. and the pulse rapid, and the patient's condition was unsatisfactory. There was epistaxis and left facial paralysis. The patient's four brothers are in perfect health. The case was diagnosed as "? thrombosis of cavernous sinus, ? intracranial tumour," and the skull was *x*-rayed, the radiological report being "increased intracranial pressure causing wide separation of sutures due to a general condition and, less likely, to localized tumour formation." No investigations, not even a blood count, could be made, as the patient died twenty-four hours after admission to hospital.

Pathological Findings.—On post-mortem examination the most striking things observed were the marked emaciation, the exophthalmos, and the enlargement of the skull out of all proportion. On opening the body the masses at the angles of the jaw were found to be soft, resembling sarcomatous tissue and being green in colour. The lungs and heart did not show any abnormality. The stomach contained a large amount of blood, evidently swallowed from the epistaxis the patient had had before death. The alimentary tract did not reveal any lesion. The liver was enlarged, and the most peculiar thing about it was the presence of green infiltrations along the portal tracts. The spleen was five or six times the usual size and was deeply congested. As to the urinary system, there were greenish infiltrations scattered in the cortex of both kidneys, but the genital and endocrine organs did not show any abnormality. The lymph glands of the neck, mediastinum, and mesentery were enlarged and discrete, with the same greenish coloration. On examining the skull and its contents thin deposits of the green material were seen underneath the temporal muscles and along the sutures, which were separated. The dura mater was found to be somewhat adherent to the interior of the skull, and subdural masses, broad and flat, were scattered all over the internal surface of the dura, only small areas of which were free (see Plate). All these masses were somewhat soft and of a green colour; they did not invade the brain, which did not show any lesion. The orbits were packed with this green material, causing the marked exophthalmos. On cutting into the petrous portions of the temporal bones the same material was also found, and this explains the left facial paralysis. The bone marrow revealed the same greenish coloration, which on exposure gradually faded into grey. Microscopical examination of the dural tumours showed the chloroma to be of the large lymphoid-cell type. These cells were infiltrating the liver along the portal tracts, the cortex of both kidneys, the lymphatic glands, the splenic pulp, and the bone marrow.

My thanks are due to Dr. M. O. Abdine, ear and nose surgeon to the hospital, for giving me the clinical history of the case.

H. BARSOUM, F.R.C.P.Ed.,
Pathologist, Government Hospital.
Alexandria.

Abnormality of Ribs

(WITH SPECIAL PLATE)

The following case possesses items of interest.

A girl aged 14 months was brought to this hospital, the mother saying she thought "that the right shoulder was a different shape from the other." On examination it was seen that the left shoulder was normal and the right appeared to be more square. There was a bony lump in the supraclavicular fossa, rather towards the posterior margin. An *x*-ray film disclosed absence of the second rib on the right side. The antero-posterior view (see Plate) shows that the ribs on that side are definitely thinner and less calcareous than those on the opposite side; they also show a concavity upwards instead of a convexity downwards.

I am indebted to Mr. G. Richardson for permission to report on this case.

W. A. BELLAMY, M.R.C.S., L.R.C.P.,
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Sydenham, S.E.

Hyperparathyroidism

(WITH SPECIAL PLATE)

The following case of hyperparathyroidism with generalized osteitis fibrosa may be considered worth recording.

CASE RECORD

A married woman, aged 40, complained of pains of a rheumatic character for the past four years, during the last two of which she had been treated for "rheumatism." At first the pain had not been severe and she could get about, but for two years she had been increasingly incapacitated by progressive weakness. During the past month she had noticed pain in the right arm and the left knee, and was radiographed. The skiagram showed some general decalcification of the bones and a cyst in the neck of the right scapula. Further radiographs revealed cysts in the os innominatum.

On examination the heart, lungs, and alimentary system were normal, and there was no urinary frequency. The patient, who was nulliparous, had been in good health up to four years ago, and her appetite had also been good. She always seemed to be drinking, but thought she had no frequency. Skeletal examination revealed a swelling in the upper part of the right arm, which was tender. The knees were also tender. The blood calcium was 15.9 mg. per 100 c.cm. *X* rays disclosed general decalcification of the bones: the right scapula, right os innominatum, left tibia at the upper end, right femur, upper end of right humerus, and right radius all contained areas of erosion. A uroselectan examination of the kidney showed a normal pelvis. No stones were present.

The patient was admitted to the Sheffield Royal Infirmary on November 17, 1936. An aspiration biopsy of the right humerus was performed by Dr. F. Ellis, and revealed an osteoclastoma. The diagnosis of hyperparathyroidism was confirmed, with generalized osteitis fibrosa. Further chemical examinations on December 12 showed the serum calcium to be 15.5 mg. and blood phosphorus 1.3 mg. per 100 c.cm. A spontaneous fracture of the upper end of the shaft of the right humerus occurred soon after admission.

Operation.—On December 20, 1936, under gas-and-oxygen intratracheal anaesthesia with rectal paraldehyde, I explored the thyroid gland and its surrounding structures. After considerable palpation and dissection a nodule about the size of a large marrowfat pea was discovered at the lower pole of the left lobe of the thyroid gland. It was lying apart from the capsule but fixed to the thyroid lobe. On dissecting it off it ruptured, and was seen to be slightly cystic. Being rather disappointed with the findings, further search was made, and behind the first nodule another was found, about the same size but firmer in consistency. It, too, was dissected out and removed. The colour did not differ from that of the thyroid tissue. Search at the lower pole on the right side also revealed a body very much like that of the second; this, too, was removed, and all were sent for section. The pathological report stated that section of the nodules showed two of them to be typical parathyroid adenomas.

Recovery from the operation was good, but two days later a feeling of "pins and needles" developed in the fingers of both hands and spread all over the body. Typical carpal spasms associated with tetany developed, and some facial twitching occurred. There were no urinary symptoms. Ten c.cm. of calcium gluconate were given twice daily with 1 c.cm. of parathormone. The spasms and other symptoms subsided rapidly, and there were none ten days after the operation. The blood-serum calcium on December 29 was 8.2 mg. per 100 c.cm., and on January 7 10.9 mg.

Since operation steady progress has been made. All pain has disappeared. The patient can walk two miles now without fatigue. Her weight has increased considerably and she no longer feels tired. The bones have regained their calcium and the areas of rarefaction have disappeared. The fracture in the right humerus united with a slight deformity.

I am indebted to Dr. L. C. D. Hermitte for cutting the sections and for the photomicrographs, and to the radiological staff of the Royal Infirmary for the *x*-ray films.

A. W. FAWCETT, F.R.C.S.,
Honorary Assistant Surgeon, Royal Infirmary.
Sheffield.

Tumour of Vocal Cord following Nasal Endotracheal Anaesthesia

As not many cases of laryngeal complications have been reported after intratracheal intubation the following may be of interest.

CLINICAL HISTORY

A married woman, aged 49, was admitted to the London Jewish Hospital on April 19, 1937, while I was house-surgeon, with chronic cholecystitis, for which cholecystectomy was performed on April 22. The operation took fifty-five minutes, and was performed under nitrous oxide–oxygen–ether anaesthesia through a medium-sized Magill's tube, inserted by the "blind" nasal route after repeated attempts. Except for some slight chest pain about three weeks after operation, which cleared up in a day or so, the patient made an uneventful recovery, and she was discharged on May 23.

On June 30, 1937, she attended the out-patient department with a complaint that she felt something moving up and down in her throat, especially on talking: that sometimes she was unable to talk, that occasionally she found herself talking in a high-pitched voice; and that once or twice she had "lost her voice" for a short time. All these symptoms were of nine to ten weeks' duration, and she had had no throat trouble of any kind previous to the operation.

On laryngoscopic examination by Mr. H. Kisch a small tumour was seen at the base of the right vocal cord. The major portion of this growth was removed on July 7, under intravenous pentothal anaesthesia. On the 14th the remaining small portion was found to have shrunk considerably and not to necessitate removal, and she was discharged on the 15th. Two months later there was no sign of the tumour, and since then she has had no throat trouble.

PATHOLOGICAL REPORT

The pathological report was as follows: "Polypus granuloma of unspecified nature from vocal cord, composed of fibrous tissue and numerous capillaries lined with larger endothelial cells: infiltrated with lymphocytes and plasma cells, and, superficially, polynuclear neutrophils covered with fibrin."

COMMENT

In view of the fact that (1) the patient had had no throat symptoms of any kind previous to operation and (2) injury to the vocal cords is a definite and recognized, though comparatively uncommon, complication of nasal intubation, one is justified in assuming the above to be a case of complication of endotracheal anaesthesia.

I wish to thank Mr. S. I. Levy, senior surgeon, London Jewish Hospital, and Mr. H. Kisch, senior surgeon, ear, nose, and throat department, London Jewish Hospital, for their permission to publish this case.

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Cambridge.

Unusual Case of Rupture of Internal Semilunar Cartilage

The following case seems worth recording on account of two uncommon features: (1) the fact that the violence which caused the lesion was of a very unusual character, and (2) the complete absence of swelling of the knee-joint at the time of the accident and after.

CASE REPORT

The patient was a quarryman, aged 29. He stated that about the middle of August last he was struck on the inner side of his right knee by a piece of heavy stone the size of a cricket-ball. He received the blow while in a sitting posture, with the right knee flexed and the foot tucked under the left leg, which was fully extended. There seems to have been no acute pain at the time of the injury, and he not only went on working that day but continued to work for two months. He noticed, however, that something seemed to move in the joint and prevent complete extension, but he found that by alternately flexing and extending the knee and rubbing the inner surface free movement returned. Then at the end of October the knee "let him down" and his usual manœuvres failed.

He consulted me on November 1, when I obtained the above history, but close questioning then and subsequently failed to elicit any description of an injury corresponding to a twist or a wrench. On examination the knee looked quite normal; there was no obvious swelling of the joint, and this was confirmed by mensuration. The man said that at no time had he noticed any swelling. Over the site of the anterior half of the internal semilunar cartilage there was a point of marked tenderness. Extension of the joint was all but complete, and attempts to make it complete caused him to wince; flexion was quite free.

Conservative treatment was undertaken, but after ten days it was found that there was no improvement. He was then seen by a surgeon, and as *x*-ray examination proved negative it was decided to explore the knee. On November 30 the joint was opened through a curved incision, and the synovial membrane was seen to be acutely inflamed, though there was very little synovial fluid. The internal semilunar cartilage was observed to be split longitudinally, and the inner portion lay in the centre of the joint—the well-known bucket-handle tear. As much as possible of the cartilage was removed.

Healing took place without incident, and there was never any effusion into the joint. On the fourth day the pillow on which the knee was supported was taken away and extension was found to be complete and painless. Movement of the limb in bed was encouraged, and in less than a week later the full range of flexion was obtained. The patient was allowed out of bed on the eleventh day and walked without discomfort on the twelfth. He is now walking well, and his only disability is some difficulty in climbing stairs.

My thanks are due to Professor Graham Simpson, who saw the man and performed the operation, for his encouragement to me to publish these notes and for his co-operation in preparing them.

HUGH G. WATSON, M.B., Ch.B.
Bakewell.

Reviews

HAEMATOLOGY

Diseases of the Blood and Atlas of Hematology. With Clinical and Hematologic Descriptions of the Blood Diseases, including a Section on Technic and Terminology. By Roy R. Kracke, M.D., and Hortense Elton Garver, M.S. (Pp. 532; 44 coloured plates; 17 figures. 65s. net.) Philadelphia, London, Montreal: J. B. Lippincott Company. 1937.

At its published price the combined textbook of *Diseases of the Blood and Atlas of Hematology*, written by Dr. R. R. Kracke and drawn by Miss H. E. Garver, must be the most expensive book on blood diseases in the English language, and one eagerly turns over its pages to discover how much the author and the publishers have provided in return. The book is beautifully printed on a large page and is surprisingly light in weight. It contains over 500 pages, sixteen figures, and forty-four coloured plates. For the two last, curiously enough, no table or index is provided, and the index to the text is defective—for example, the reviewer looked in vain for osteosclerotic anaemia or leuco-erythroblastic anaemia and myelomatosis or Kahler's disease, though both subjects are mentioned in the text. The illustrations are well chosen and well reproduced, but while some of them are good, on the whole the artistry, and especially the representation of nuclear detail, fall below the standard of Continental textbooks. Compare, for example, Plate XI, nucleated erythrocytes, with Plate I in the 1923 edition of Naegeli's *Blood Diseases*.

Sections 1, 2, and 3 deal with terminology, morphology, and physiology of the blood cells. Dr. Kracke makes a strong case against the confusion and illogicality of current haematological terms, and pleads for a system which would prevent the introduction of contradictory words such as agranulocytosis. Unfortunately Dr. Kracke has been unable to avoid the pitfalls which beset attempts to reform terminology, and though he has not got so deeply bogged as Osgood some of his suggestions are hybrids, such as acidocyte for eosinophil polymorphonuclear and fragilocyte for the fragile cell of acholuric jaundice, and needless discords such as baso-erythrocyte and poly-chromatocyte. Scientific terminology cannot be reformed or standardized by a single individual, as is shown by the confusing efforts of Osgood and Kracke, or by a committee of a single nation, as is shown by the recent *faux pas* of the Council on Pharmacy and Chemistry of the American Medical Association. The time is ripe for an international co-operative attack on haematological nomenclature.

Sections 4, 5, and 6 deal with anaemias, leukaemias, and haemorrhagic diseases, which are clearly and simply described, though the note of personal experience is often lacking. Statements from the literature which most haematologists would disbelieve, such as that on the value of treating polycythaemia by gastric drainage or lavage, are given the same weight as the confirmed evidence of good authorities. Tropical nutritional anaemia is not mentioned (is that because haematologists in the United States of America have never distinguished it from sprue and pellagra?), and the account of leuco-erythroblastic anaemia is too meagre. Morbid anatomy and histology are almost entirely omitted. Splenic anaemia has some fifteen lines only under the anaemias of childhood. There is no discussion of Hodgkin's disease and related lympho-blastomatous conditions, or of their separation from more

benign adenopathies such as Schaumann's disease, though these subjects have important practical bearings, and where can they be discussed better than in a textbook of haematology? Section 7 deals with miscellaneous conditions, and includes a good account of malaria. Section 8, on haematological technique, contains much useful information, but might have been better adapted to the needs of the text. The May-Grünwald-Giemsa staining method is not described, though it is recommended on page 407, whilst the Gordon test for Hodgkin's disease is given in full, though the text omits even the barest account of Hodgkin's disease.

All this is not to deny that the book gives much useful and readable information about important aspects of haematology, but merely suggests that it does not give sixty-five shillings' worth. To write a good textbook of haematology needs almost as unique qualities as to draw the sword Excalibur or the bow of Ulysses—much clinical work with patients, much experience of clinical pathology and morbid anatomy, much reading of publications in very different fields—and we still await the man who will combine these qualities with the patience to write a book.

A HANDBOOK OF MALARIA

Malaria: A Handbook of Treatment, Parasitology, and Prevention. By Bernard Nocht, M.D., and Martin Mayer, M.D. With a foreword by Sir Rickard Christophers, C.I.E., F.R.S. (Pp. 196; 25 figures, 2 coloured plates. 10s. 6d.) London: John Bale Medical Publications. 1937.

Professors Nocht and Mayer, as previously noted in this *Journal* when reviewing the German edition, have performed a most useful task in bringing out, in the form of a small handbook, a short modern account of malaria. The appearance now of an English edition of their work will still further add to its usefulness. The English translation is a small, handy, attractively printed volume, with a foreword by Sir Rickard Christophers. The account given is complete and up to date, and the book forms a ready means of reference to the most recent ideas on diagnosis, treatment, and prophylaxis, otherwise only to be found scattered through the extensive literature of the subject. It is especially up to date in the amount of information given regarding the new anti-malarial synthetic compounds such as atebrin and plasmoquine and their use in treatment and prophylaxis, as well as in the very full and detailed discussion on the dosage, modes of administration, and properties of quinine. After a brief reference to the history of malaria discovery, distribution, and statistics, an account is given of the clinical picture in malaria, including the characters of the attack by different forms of the parasite, pernicious manifestations, features of the disease in children, and the subsequent course and effects of the disease. Following this is an important chapter on treatment, dealing fully with the drugs used and their methods of administration. Next come short sections on such subjects as pathological changes in malaria, useful biochemical tests, induced malaria, immunity, serological reactions, and ape malaria. An adequate account is given of the technique of preparing and examining blood films and of the characters of the different parasites. There is a chapter on blackwater fever, and, finally, a short survey of the development of the parasite in the mosquito host and a very brief summary of preventive measures against malaria.

In the nomenclature of the types of parasite and forms of malaria the English edition has, rightly in the reviewer's opinion, followed the usual English rather than the German custom. Thus the parasite of malignant tertian is referred to by the now almost universally accepted name among English and American writers of *Plasmodium falciparum*, and not *P. immaculatum*, as commonly employed by German writers and as given in the German text. The term "malaria tropica" has been replaced, as is usual among English writers, by "malignant tertian." Otherwise the translation follows the German text closely. While the book fulfils admirably the purpose for which it was, as the authors state, originally written—namely, for the use of the postgraduate student and medical man—it will also be of much service to the expert as a work of reference.

PICTORIAL AIDS TO DISSECTION

Illustrations of Regional Anatomy. By E. B. Jamieson, M.D. Five volumes. Second edition. (211 plates. 32s. 6d., postage 9d.) Edinburgh: E. and S. Livingstone. 1937.

The second edition of Dr. Jamieson's *Illustrations of Regional Anatomy*, Sections I to V, with the addition of Sections VI and VII, of the lower limbs, represents the complete series of this excellent pictorial aid to the student's work in the dissecting room and his study of the descriptive textbooks of human anatomy. Many new coloured blocks have been prepared for this edition, and some of the plates have been enlarged. The addition of colour is especially helpful in the distinction of certain of the nerve tracts of the brain, such as the superior and inferior longitudinal fasciculi, the cingulum and tapetum, the limits of which are not readily distinguishable in actual specimens. Also the clear, unabbreviated labelling of the illustrations is of great value at the present time, when so much has to be learnt in a very limited period of the student's curriculum. Moreover, the importance of a visual concept of the structural relations of parts being readily grasped and retained in the memory is a practical consideration which can hardly be overestimated.

Few criticisms are necessary in a work of such general good quality. From the artistic standpoint, however, some of the hollow viscera appear too rigid and too solid. Also, in Plate IV, the pharyngo-tympanic tube on the right side appears to slope forwards from the pharynx instead of backwards and laterally. That a demand for a second edition should have occurred so soon after the publication of the first is ample evidence of the sterling merit and usefulness of the work, and we can confidently recommend the "illustrations" as a reliable aid to junior and advanced students of human anatomy.

ELEMENTS OF PATHOLOGY AS APPLIED TO MEDICINE

An Introduction to Medical Science. By William Boyd, M.D., M.R.C.P.Ed., F.R.C.P.Lond. (Pp. 307; 108 figures. 16s. net.) London: Henry Kimpton. 1937.

Professor William Boyd, whose books on medical and surgical pathology have been so well received by students and teachers, has set out in his *Introduction to Medical Science* the elements of pathology as applied to medicine, and hopes that it will be found useful to medical students in the intermediate years of their course, to nurses, and to hospital technicians. He limits his subject-matter to an introduction, but has succeeded in his object of showing that the closest relationship exists between the pathological changes or lesions in the organs and the symptoms from which the patient suffers. The book follows the usual lines, the general principles of pathology being discussed under the headings of the causes of disease, bacterial and animal parasites, the phenomena of inflam

mation, immunity and allergy, the disturbances caused by changes in the blood flow, and a general idea of tumour formation and malignancy. The separate organs are then dealt with systematically. The illustrations are good and numerous—over one hundred to the three hundred pages of text; many are explanatory diagrams and others are excellent photographs of patients and pathological specimens. This part of the book, as it comes from a master hand, gives a very good summary of knowledge, linking up the physiology of the body with the changes occurring in the pathological state. It might be useful to students before taking up a larger textbook, but is too short and lacking in detail to be sufficient in studying for examinations. For nurses it may be too elaborate, but could be usefully adapted by the lecturer to nurses as the basis for their instruction, without their studying it themselves. It is in the author's intention, however, that nurses should read it during their training, as he has added some practical chapters at the end on the means of preventing disease and on the duties of the patient's nurse in collecting for laboratory examination and testing the various excreta and pathological material required.

THE CONTROL OF NOISE

Noise. By A. H. Davis, D.Sc. No. 6, Changing World Library. (Pp. 148; 20 figures. 2s. 6d. net.) London: Watts and Co. 1937.

The problem of noise and its prevention is approachable from the point of view of psychology and of physics. Dr. A. H. Davis, although his work lies in the Physics Department of the National Physical Laboratory, so that he may be supposed to be chiefly interested in the various physical expedients for reducing the noise nuisance, such as floating floors, baffle silencers, rubber insulators, and various upholstery, by no means neglects the psychological approach. It is open to question whether we live in a noisier age than our fathers, but it cannot be doubted that we are more sensitive to noise. Herbert Spencer's ear-stoppers and Thomas Carlyle's double windows suggest that the Victorians had something to put up with, even before the mechanical age got fairly started, but apart from such irascible spirits as those just named the people in general did not seem to mind it. The modern man passes through streets noisy with traffic, but he has learned not to hear it, and goes to an office noisy with typewriters or a factory with more clamorous machinery, to which he adjusts himself, and in the evening he bears with philosophic patience the gramophones or radio sets of his family or his neighbours. No doubt a great deal can be done by the normally healthy person to accommodate himself to a noisy environment. How largely the problem is a psychological one is suggested by the fact that many town dwellers who can sleep in rooms overlooking a trolley tram route are unaccountably distressed by a rural night, with its continual rustlings and patterings, croakings and chirrupings.

The effect of noise on the human organism still calls for study. That it induces fatigue can hardly be doubted, if only by reason of the increased effort to speak and to hear. It is said that listening to jazz music has the effect of slightly increasing the physical strength as represented by strength of grip—perhaps a convulsive movement of the hand as if to throw something at the players. The sense of smell and the normal ability to distinguish slight changes in colour are also said to be increased under the stimulus of noise, which suggests a fear reaction, rendering other senses more alert. In later chapters the author discusses the measurement, control, and elimination of noise. But when all is said and done the best sound-absorber is good manners. The young gentlemen who bang their car doors at midnight and make a noisy get-away need to have it brought home to them that they are guilty of anti-social behaviour, and so do all the rest of us who cause unnecessary noises. It is a question of education, on the one hand, and, so far as concerns the noise which unavoidably accompanies industry and transport, it is a question of mechanical engineering to make it as little noticeable as possible.

BIBLIOTHECA MEDICA AMERICANA

Vol. I. *A Brief Rule to Guide the Common-People of New-England How to order Themselves and Theirs in the Small Pocks, or Measels.* By Thomas Thacher. First published in 1677/8, reprinted in 1702 and 1721-22. Foreword by Henry R. Viets, M.D. (Pp. 52. 7s. net.) Vol. II. *A Discourse upon the Institution of Medical Schools in America.* By John Morgan. Reprinted from the first edition, Philadelphia, 1765. Introduction by Abraham Flexner. (Pp. 63. 9s. net.) Vol. III. *Adaptation in Pathological Processes.* By William H. Welch, M.D., LL.D. Reprinted from Transactions of the Congress of American Physicians and Surgeons, 1897, vol. IV, pp. 284–310. Introduction by Dr. Simon Flexner. (Pp. 58. 7s. net.) Baltimore: The Johns Hopkins Press; London: Humphrey Milford.

These three little reprints form the first three volumes of the fourth series of the Bibliotheca Americana published by the Institute of the History of Medicine from the Johns Hopkins University at Baltimore. They show the interest which the medical profession in the United States is taking in the medical history of their own country under the guidance of Professor Henry E. Sigerist. Each volume is printed in facsimile type, is provided with a portrait, and is given an introduction.

Thomas Thacher published his *Brief Rule* in 1677/8, and Dr. Henry Viets has made the volume noteworthy by the very excellent life of the author which introduces this reprint.

John Morgan, who wrote on the *Institution of Medical Schools in America* in 1765, is introduced by Dr. Abraham Flexner. He was of Welsh ancestry, and late in life studied under the Hunters in London, and afterwards in Edinburgh, Paris, and Italy. He returned to Philadelphia, and became well known as the first professor of medicine in America. His pamphlet is well worthy of reproduction on account of his high ethical standard, and for his advocacy of a sound preliminary education for those who desired to practise medicine.

Professor W. H. Welch's *Adaptation in Pathological Processes* is introduced by Dr. Simon Flexner. The essay is good reading, although it was written in 1897. It shows the influence that Cohnheim and Weigert had exercised over a mind that was by nature thoughtful and acquisitive.

Notes on Books

An eighth edition of Pearce Gould's *Elements of Surgical Diagnosis* (Cassell, 10s. 6d.) has been published eight years after the seventh edition and just fifty-three years since the first appearance of this work, which was originally written by Sir Alfred Pearce Gould and is now edited by his son, Mr. ERIC PEARCE GOULD. The reputation of this little book is so well established, particularly among medical students, that only passing reference need be made to it. In common with Treves's *Surgical Anatomy* and one or two other small manuals, it may be described as a student's vade-mecum, and the bulge seen in his pocket is not infrequently caused by it. The new edition includes a reference to intravenous pyelo-

graphy and some alterations in pathological nomenclature found necessary to bring descriptions of certain conditions into line with current opinion regarding their nature of origin—for example, osteoclastoma for the old myeloma. In the section on thyroid enlargements reference might have been made to the fact that a goitre displaces the common carotid artery outwards and backwards, as this is a diagnostic feature which has proved of value in certain cases. Twenty-two plates reproducing radiographs add to the value of the work; thus, for example, the x-ray appearances of the bismuth "swallow" in achalasia of the cardia and in oesophageal cancer may readily be compared and contrasted.

In the work entitled *Sex, Custom and Psychopathology* (London: George Routledge, 21s.), which is an ethnological and psychiatrical study of the South African pagan native, and particularly of the Tembu tribe, Dr. B. J. F. LAUBSCHER, senior psychiatrist to the Union Mental Service, gives a detailed account of the social practices, beliefs, and customs, and their influence on psychopathology in a primitive culture. The author's information was obtained from the hospital staff in the native wards, native doctors and diviners, the heads of kraals, elders and councillors, chiefs, etc., and the magistrates and native commissioners. In addition to a full description of the natives' folk lore, in which phallic worship plays a prominent part, an elaborate account is given of the initiation ceremonies which mark the transition from childhood to manhood or womanhood and form the most important epoch in the life of the native living in the kraal; the conception of mental disorder held by the native, which is closely connected with his environment and influenced by the customs and beliefs underlying witchcraft and magic; and the incidence of sexual offences, suicides and homicides among the natives. The text is interspersed with photographs of the natives and their ceremonies, and various types of mental disease. This vast collection of original research is a valuable contribution to anthropological and psychiatrical literature.

Many of our readers will like to see and to possess a little booklet entitled *An Austin Twelve on the Frontier*. It is by Dr. E. GERTRUDE STUART, formerly in charge of the Church of England Zenana Missionary Society Hospital at Quetta. It consists of some forty pages only of actual text, but it contains also a considerable number of excellent photographic illustrations and is so well written as to present a very vivid and most interesting picture of medical missionary work on the North-West Indian border. After a few graphic pages on "The Frontier and its People" and on "The Building up of a Medical Mission," the narrative takes an autobiographical form, being put into the words of an old Austin car which has seen and done remarkably good service in a great cause. This scheme of presentation is carried out more effectively than such a method generally is. The medical and missionary work at the Good Shepherd Hospital and in the surrounding villages, the happenings of the great earthquake, the salving of lives and of property, and the heroic attentions to the sick and the injured are well described and indicated, and the booklet as a whole constitutes a most effective appeal for interest in, and practical help for, the work of the society under whose auspices it is issued at the price of 6d.

Protoformotherapy in Treatment and Prevention: Fifteen Years of Research on New Scientific Bases of Therapeutics, by Dr. N. E. ISCHLONDSKY of Paris (London: Kimpton, 21s.), contains an account of three lectures delivered by the author in Cairo under the title, "The Internal Secretion of the Embryonic Tissues, its Biological Significance and its Importance in Practical Medicine." He claims that "protoformative incret," which appears to be some form of extract of embryonic tissue, is a cure for very many forms of disease.

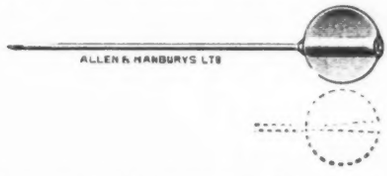
De l'Influence de Divers Cations sur le Croît Microbien, by Dr. LUCIEN NEIPP (Paris: Masson, 90 fr.) is a monograph of which the greater part is devoted to a summary of researches which the author has carried out in this subject. The observation that the presence of minute traces of metals in some cases favoured the growth of micro-organisms promoted the popularity of the Arndt-Schulz hypothesis, which states that toxic agents in minute doses produce a favourable action. Dr. Neipp found that salts of lanthanum, cerium, lead, and mercury when present in minute concentrations did cause augmentation of bacterial growth, but, curiously enough, no such effect was observed in the case of silver. He examined also the influence of metals on the surface electric charge of bacteria, but concluded that the effects produced by metals could not be attributed to their producing changes in the surface potential. The monograph is fully illustrated with tables and graphs summarizing the author's experimental results.

Preparations and Appliances

A SUTURE NEEDLE

Mr. NÖEL E. WATERFIELD, F.R.C.S. (Great Bookham, Surrey), writes:

Messrs. Allen and Hanburys have made at my suggestion the suture needle shown in the illustration. It consists of a needle, straight or curved, hollow in its whole length. At the



end distal from the point there is a flattened disk by which the needle is held; this same hollowed end is slightly funnel-shaped.

The method of use is for the needle to be inserted through both edges of the cut; the suture is then threaded through the needle until the end projects, this being then held and the needle withdrawn.

The advantages are: (1) The painlessness with which a suture can be inserted, due to the fact that there is no drawing through the skin of two thicknesses of ligature and the needle at the same time, but only the puncture of the needle itself; this, to take the same size suture, is of much smaller calibre in comparison with the ordinary needle. (2) The ease of threading. The "eye" of this needle is much larger in proportion than that of the ordinary needle.

THREE NEW PREPARATIONS

Messrs. H. R. Napp, Ltd., 3, Clements Inn, Kingsway, W.C.2, have sent samples of the following three products which they are introducing:

"Carbomucil" is a granular preparation of activated charcoal with desiccated vegetable mucins. The makers claim that the granules will disintegrate in the bowel, and that absorbent action of the charcoal will be exerted there and will not be exhausted in the stomach. The preparation is recommended for conditions in which there is absorption of toxins from the intestinal tract.

"Immidiol" is a fluid which contains anthraquinone glucosides in a salicylic acid alcoholic solution. It is recommended as a gargle (half a teaspoonful in half a glass of water).

"Caapi" or anti-coryza tablets contain atropine sulphate, caffeine, phenacetin, and quinine. They are recommended for the treatment of acute coryza.

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THE ASSOCIATION'S MILK POLICY

It is not the desire of this *Journal* to criticize the views of other organs of the Press as to what the public should or should not be told, but the position revealed in an article in the *New Statesman and Nation* of January 22 calls for a statement of the British Medical Association's milk policy. Without committing itself to support of this policy the article expresses doubt as to the propriety of newspapers refusing the Association's advertisements urging that milk should be safe. The occurrence of milk-borne disease has been a matter of constant concern to successive generations of medical practitioners, and many family doctors consistently advise their patients to boil all milk before consumption. They deprecate especially the use of raw milk for the feeding of infants and young children, because it may contain tubercle bacilli and other pathogenic micro-organisms. Until recently, however, there was some division of opinion as to the form which a national programme should take. Some medical men thought, with the more enlightened agriculturists, that a planned policy for the eradication of disease in herds and the safeguarding of milk from contamination at the source or in transit was practicable and desirable. They knew that the measures which medical officers of health were able to take in farms and dairies were hampered by the inertia of their own councils and the imperfections of the law, but they watched with interest and sympathy the efforts of the Ministry of Food and, later, of the Ministry of Health to raise the standard of the milk business by a voluntary system of grading. Even those who were sceptical as to the prospect were unable to disregard the increasing importance attached to the quality of freshness in food, following the remarkable series of discoveries relating to vitamins since the first decade of this century. They recognized that the detriment to health from the heating of milk *might* be greater than the gain from reducing its liability to convey infection. So long as there was room for doubt on this point the Association refrained from expressing its corporate opinion.

Since the war wide experience of the feeding of infants of all social classes with dried, and therefore denatured, milk appropriately supplemented by vitamins, and numerous feeding experiments both on human beings and lower animals, have proved beyond scientific doubt that heating does not, in practice, detract from the value of milk as a food. At the same time, pasteurizing plant and practice have reached a high level of efficiency, and the phosphatase test has furnished a reliable index of the proper application of the method to any volume of milk ostensibly pasteurized. Officers of local authorities have learned from Government publications and the terms of official Orders how to inspect the equipment and procedure of pasteurizing firms, and plant is obtainable at a reasonable cost for handling milk in relatively small bulk. Pasteurization on a wide scale has therefore become a practical proposition. On the other hand new knowledge of the prevalence in cattle of diseases like contagious abortion, and streptococcal and salmonella infections communicable to man has made it clear that elimination at the source is a far bigger problem than used to be thought.

With these facts before it the Council of the British Medical Association reported to the Annual Representative Meeting in 1935 that, in its opinion, "local authorities should be enabled, after a reasonable period of notice, to prohibit the sale in their areas of milk which is not from tubercle-free herds or has not been submitted to approved treatment to render it bacteriologically safe." The Council's report was approved. In 1936 it was felt that the milk question should be fully ventilated, and accordingly the Representative Body of the Association was asked to vote on a recommendation "that only milk complying with the conditions required for the designations 'Tuberculin Tested' or 'Pasteurized,' or preferably both, can safely be consumed without boiling." In moving the recommendation the Chairman of the Public Health Committee made a full statement on the milk position, in the light of modern knowledge. After discussion the recommendation was adopted with only one dissentient, and accordingly became the policy of the Association. A year later the Representative Body was informed that this resolution had been conveyed to the Ministry of Health, a further opportunity thus being offered for the expression of any contrary opinion. There was no opposition. This policy can therefore safely be assumed to express the considered and remarkably unanimous opinion of the members of the Association, which has therefore endeavoured to propagate it. The policy appears to have been endorsed by the Government itself, for as recently as last July, in a Command Paper entitled *Milk Policy*,[1] it announced its proposal "that, subject to certain conditions, any Local Authority shall be enabled to apply to the

[1] Cmd. 5533. H.M. Stationery Office, July, 1937. (2d.)

Minister of Health, or the Secretary of State for Scotland, for an Order making compulsory the efficient pasteurization of milk sold by retail in its area." In recent official publications, while an increased consumption of milk is advocated, the factor of safety from pathogenic micro-organisms has been stressed.

The Association is in complete agreement with the view that the physical well-being of the people would be enhanced by increased consumption of milk, but it is alarmed at the spectacle of a publicly financed campaign for more milk-drinking unless the milk is rendered safe by pasteurization, or at least made less liable to convey disease by tuberculin-testing of cattle and the elimination of the reactors from herds supplying milk for human consumption. The Government may propose, but Parliament disposes. Opposition to the policy outlined in the White Paper may still be strong enough to defeat it or to twist legislation into a worthless form. The motive behind the Association's campaign is not to undermine any reasonable confidence in the nation's milk supply but to help the Government in its well-designed proposals for securing that the supply generally merits confidence, by placing the facts before the public and their representatives. The milk producers and their representatives would be well advised to realize that a greater consumption of milk in this country is unlikely to be attained unless there is some guarantee of its safety, and that the mere cleanliness on which they tend to concentrate is not enough.

DRUG ALLERGY

Sensitization to chemical compounds is a fascinating, if at times alarming, study. Alarming are the fatal allergic reactions in human beings which have followed the ingestion of even minute amounts of aspirin; fascinating are the varied animal experiments conducted during the past fifteen years to determine the precise manner in which these chemicals lead to anaphylactic responses. In order that the full significance of these reactions may be grasped a few of the facts concerning allergy to chemicals and drugs should be appreciated. We are not concerned here with reactions caused by drugs applied locally to, or in various occupations coming directly into contact with, the skin, but with drugs or chemicals usually inhaled, ingested, or injected. It is necessary to distinguish between the allergic reaction to the drug and the toxic action. In the latter case the symptoms are an exaggeration of the pharmacological action, and so vary from drug to drug; they may be produced in all persons by an overdose. In another group of persons the ordinary pharmacopoeial dose of the drug, which should bring about only a normal physiological response, gives rise to similar toxic symptoms, and to these cases the term "drug intolerance" is applied. In cases of drug allergy even a fraction of the average dose of the drug will excite —only in certain persons—a train of symptoms never produced by the toxic action of the drug; they include fever, skin eruptions, asthma, and vasomotor rhinitis, and similar or identical clinical manifestations occur whatever the chemical nature of the drug. In fact it seems remarkable that an allergic reaction to such antipyretic drugs as antipyrine or quinine often includes hyperthermia. The same drug may cause a different grouping of the characteristic clinical symptoms in different allergic individuals, but it is always some of the same group of allergic symptoms that are produced by widely different drugs. It is usual for drug allergy to exist to only one substance or chemical group (for example, the phenyl group), and in this respect drugs differ from protein antigens in that in the latter the allergy is to the entire molecule, whereas in the former a certain element or chemical group is responsible. Variations may arise even in very closely related isomers of the same drug, allergic reactions following the use of the laevorotatory compounds while no allergy exists to the dextrorotatory isomers. Also, in allergy to a glandular product such as insulin the sensitiveness may exist to the protein of the animal from which the endocrine product was derived (for example, pig, ox, sheep), but in some cases it occurs with the pure hormone itself. Allergic reactions to drugs are quite common in persons allergic to ordinary protein substances, and the manifestation produced by the drug is usually the common condition from which the patient suffers. Skin tests with drugs are usually of little or no value except in cases of contact dermatitis. Many of the drugs are insoluble, and so intradermal tests are not possible. Negative reactions are often obtained in individuals with definite clinical sensitivity, while some drugs (for example, morphine and codeine) give prominent wheal reactions even in normal skins.

On the clinical side such facts concerning the natural drug allergies are well exemplified in a recent study undertaken by H. F. Buchstein and L. E. Prickman.[1] They have surveyed the literature concerning allergic reactions from aspirin and have reviewed sixty-two cases from the records of the Mayo Clinic. The following were the common characteristics. (*a*) In practically all cases there was

[1] *J. Amer. med. Ass.*, 1937, **108**, 445; *Proc. Mayo Clin.*, 1937, **12**, 616.

either a personal or a family history (or both) of allergic disorders, especially asthma. (*b*) The first onset of symptoms in a few cases followed the first known ingestion of the drug, but in most the drug had been taken many times before without ill effect. (*c*) The reaction is usually an exacerbation of the patient's allergic disease, quite rapid in onset, coming on within a few minutes to a few hours, and usually exceptionally severe, prolonged, and resistant to treatment with adrenaline. Many deaths have been recorded. Oedema appears as the characteristic pathological finding, whether of the lungs, face, larynx, or gastro-intestinal tract. (*d*) There was a high incidence of nasal polypi in patients extremely hypersensitive to aspirin. The moral of the study is that aspirin should be employed with caution in any allergic patient, especially if asthmatic, and that it should never be given to one who has nasal polypi. J. S. Davis and L. F. Frissell,[2] from a survey of the literature on amidopyrine and from their own experience, favour the view that agranulocytosis is an allergic reaction to amidopyrine. In skin tests with amidopyrine on fifty individuals the only positive reaction was obtained in a patient who was extremely sensitive to the drug. On the experimental side Landsteiner and his co-workers have studied the sensitization of animals with simple chemical compounds by intracutaneous or superficial administration. They had shown previously (1922, 1924, 1930) that artificially conjugated antigens could sensitize, their reactions being specific for the substance linked to the protein. In further experiments (1935, 1936), using benzoyl chloride and *p*-chlorobenzoyl chloride, they suggested that the sensitization effects induced were due to conjugated antigens formed *in vivo*, but they did not consider this very surprising, as both substances were easily decomposed by water and were highly reactive with proteins. In recent experiments[3] they have employed picryl chloride (2:4:6 trinitrochlorobenzene) and 2:4 dinitrochlorobenzene, substances relatively stable as regards both their solubility in water and combination with serum proteins at serum alkalinity, and both known to cause allergic phenomena in human subjects, the former on intracutaneous administration and the latter in industrial workers handling it. Sensitization followed a series of intracutaneous injections, the presence of antibodies in the serum was shown by passive transfer, and shock resulted when the corresponding protein conjugate made by gently shaking horse or guinea-pig serum with the finely ground drug was given intravenously. These later experiments again suggest the combination of the simple chemical with some substance of the animal body to form an antigenic conjugate. The protein conjugate theory would hardly seem to apply to natural drug allergies, for in ordinary cases the reaction occurs far too quickly to allow time for any protein union, such as with insoluble aspirin, but nevertheless Landsteiner's experiments are very convincing in the absence as yet of any worthy alternative theory.

[2] *J. Lab. clin. Med.*, 1937, **23**, 107.
[3] *J. exp. Med.*, 1937, **66**, 337.

DOES THE SHOE FIT?

Much attention has been devoted in the past few weeks in our correspondence columns, and subsequently in the lay press, to the question of the provision of "correct footwear." The Government industrial research organization also has been investigating the best type of footwear to suit various trades and occupations. To some the problem appears easy to solve. They believe that by the adoption of a shoe having a tight-fitting heel raised but slightly off the ground, a broad spatulate toe giving freedom of movement for the toes, and a straight inner border, all the many foot troubles of the present day (except, of course, those due to congenital lesions or acquired disease) might be abolished entirely. There is reason, however, to think that the problem is not quite as simple as this. It will be agreed that in modern civilized conditions some form of foot protection is needed and that such protection can only be adequately achieved by something more than a mere sandal—in other words, by a form of shoe having "uppers." If this is conceded it is obviously of the utmost importance that the means of protection should not in itself produce disability. Those who have implicit faith in Nature advocate shoes of the above type because they believe that in this way they are restricting the foot as little as possible in the carrying out of its natural functions, and that in these circumstances no disability can possibly arise. Unfortunately, under civilized conditions our feet have very unnatural functions to perform. A moment's thought will show that the adoption of level roads and pavements, etc., means that we use our feet only in a limited and stereotyped way, and that in consequence many of the movements of which they were previously capable are abandoned, while, within the limited range of movement now required, the strains, stresses, and wear and tear are increased excessively. Furthermore, the foot is a part of the body which is undergoing comparatively rapid evolutionary change, in which, therefore, variations in the proportions and strength of its components are both large and common. While in no way belittling the tragic effects of outrageous forms of footwear, we should be careful that all the facts have been assessed before we lay the blame for all foot troubles upon the manufacturer of boots and shoes: perhaps the adoption of an unnatural mode of life also has something to do with it. Indeed, a shoe having the purely negative virtues mentioned above may not in the long run be as advisable as one which lends some positive assistance and support to a structure which is grossly abused by the restricted

functions which civilization forces upon it. Lake, in his book on the foot, gives reasons to suppose that many deformities, such as hallux valgus, splay-foot, etc., are due as much to inherent tendencies in the foot as to the abuse of footwear. How otherwise can the numerous cases of these conditions which occur in patients who have never worn extreme types of footwear be explained? Lake concludes thus: "We can sum up man's footwear of to-day by saying that, if not quite ideal, it is at least a happy compromise with utility and as such cannot be subjected to much serious criticism. The same cannot be said, however, in the case of women's shoes, for here the manufacturer has been compelled to bow to the dictates of fashion." If this attitude is correct it would be rash to assume that much improvement would necessarily follow the universal adoption of "rational" footwear. Nor would it be wise, without much more investigation and unanimity of opinion, to dictate to the shoe manufacturer what constitutes the ideal shoe, lest it be a case of the blind leading the blind. The most altruistically inclined maker of rational footwear has to depend for guidance upon mere creeds which he sometimes mistakes for scientific knowledge. As a result there is on the market to-day footwear extolled because it throws the weight on to the outer border of the foot, or in another make on to the inner border of the foot, in another because it is rigid, and in another because it is flexible. Amidst such diversity of opinion it is dangerous to be dictatorial. There is a real risk of falling into an error, common enough, of attributing every trouble which arises to the operation of some external and preventable cause. This specious assumption is popular since the alternative suggestion that inherent tendencies may be responsible leads logically to some uncomfortable and unwelcome conclusions. There is obviously need for careful inquiry into the whole subject by a group of unbiased people representing various shades of opinion from both the medical and the manufacturing aspects. It may be recalled that Charles V found it necessary to forbid the wearing of *trop ultrageuses poulaines*, and that in this country in the reign of Mary the width of the broad-toed shoe of Henry VIII was restricted by royal decree to six inches.

INFLUENZA VIRUS VACCINES

Active immunization against virus diseases is often believed to demand the administration of living virus, however attenuated. It has recently been pointed out by Bedson[1] that this belief can no longer be accepted; killed virus will immunize experimentally against several infections, such as herpes and psittacosis, and in practice as well as experimentally against distemper. There were therefore reasons for hoping that killed preparations of influenza virus would immunize. That they do so was proved experimentally, and attempts were made during last winter in this country by Andrewes and Wilson Smith to apply this method in the clinical field, unfortunately with inconclusive results. Meanwhile, investigators in the United States have adopted the bolder plan of injecting suspensions of living virus intramuscularly for the purpose of immunization, since it appears that the administration even of fully active virus by this route is followed by no ill effects. An account has now appeared by Stokes, McGuinness, Langner, and Shaw[2] of two years' efforts on these lines. The subjects of the experiment were the inmates of five State Colonies—institutions which have more than once before proved a boon to the immunologist conducting a practical test on a large scale—and the treated individuals and controls were separated on an alphabetical basis, than which nothing could be more judicial. The preparation of virus used was a chick embryo culture, and no ill effects were caused by it. The results may be expressed briefly by saying that among individuals so treated the amount of febrile upper respiratory tract infection was significantly less than in controls; reckoned in numbers of such attacks the difference is less than when reckoned in total days of fever. It must therefore be concluded that this method of immunization does afford a substantial degree of protection. With more concentrated virus suspensions and perhaps more frequent administration the results might possibly be even better. Whether this method will ever be capable of general application is another matter. Taking the broadest possible view of the problem, it may well be asked whether epidemic infections of the air passages cannot better be attacked by some other means altogether, perhaps by mitigating the conditions in which they spread. These are air-borne infections which thrive as a rule only in winter, and it may prove in the end more feasible so to purify the air we breathe that their spread is prevented than to try to protect ourselves by inoculation against what, after all, are insanitary conditions.

[1] *Proc. roy. Soc. Med.*, 1937, **31**, 59.

BUMPER FRACTURES

Attempts to improve riding comfort and increased speed have led to a lowering of the height of the chassis of the modern motor car the world over. The chassis height, as measured from the level of the road, determines the position of the bumpers and the site at which fractures take place when the bumper comes into violent enough contact with the legs of a pedestrian. A fracture by direct violence is produced just below the knee, and the popliteal artery or its terminal branches may be damaged and gangrene of the foot result. F. G. Dyas and M. L. Goren of Chicago have lately emphasized the significance of these facts in a paper on bumper and fender fractures.[3] Within six months four patients with gangrene following such fractures were seen in the Cook County Hospital, and these cases are becoming frequent in this country as well as the U.S.A. F. J. Cotton and Richard Berg[4] introduced the term "bumper fracture" some eight years ago, and defined it as a crushing injury produced by abduction of the leg forcible enough to smash the external tuberosity of the tibia against the fulcrum of the

[2] *Amer. J. med. Sci.*, 1937, **194**, 757.
[3] *Surg. Gynec. Obstet.*, 1937, **65**, 690.
[4] *New Engl. J. Med.*, 1929, **201**, 989.

lateral condyle of the femur. The popliteal artery is most vulnerable in the lower part of its course where it is related to the popliteus muscle behind the head of the tibia. At this point, just below the origin of the lowest genicular branches of the main artery, the collateral circulation is poorest; hence damage at this site is likely to result in gangrene. In addition to the risk of indirect traumatic gangrene, bumper fractures are liable to produce much disability by depressing the outer tibial condyle and so interfering with normal movements at the knee-joint. Dyas and Goren describe a method of elevating the depressed condyle by means of a bone graft in cases which cannot be treated successfully by manipulation.

NEUTRONS FOR RADIOTHERAPY

Knowledge of the behaviour of neutrons has rapidly accumulated since their discovery by Chadwick less than six years ago. Physical methods of detection are probably not hindered by the smallness of the amount of matter or energy which may be dealt with, but biological research generally needs relatively strong sources of energy before any well-marked effects can be observed. The invention of the cyclotron by E. O. Lawrence[1] within two years of the discovery of the neutron was thus of the greatest importance to biological research. In this apparatus a beryllium target is bombarded with 5-million-volt deuterons (heavy hydrogen nuclei), and a beam of neutrons is produced comparable in power to the *x*-ray and gamma-ray beams used in radiotherapy. It will be remembered that whereas the absorption of *x* rays concerns mainly the electronic system of the atom, that of neutrons is restricted to the nucleus. Thus, with *x* rays, the heavier the element the greater is the absorption; but for neutrons, the laws of absorption of either corpuscular or quantum radiation do not apply. Their absorption depends rather upon the collision cross-sectional area of the nucleus, so that a high coefficient of neutron absorption is found for some elements of very low atomic number—for example, hydrogen, lithium, and boron. For *x* rays, gamma rays, or neutrons, however, the result of absorption is the production of ionization tracks in the tissues. It would therefore be expected that the biological effects of these various radiations would be essentially similar, though some differences might arise from different selective absorptions of the primary radiation or from the varying velocities of the ions produced. So far the biological effects of irradiation with neutrons have been observed to be similar to those produced by *x* or gamma rays. Thus animal lymphoid and haemopoietic tissues[2] have been found to be the most affected by neutrons, as they are by *x* rays; the lethal effect on Drosophila eggs, the retardation of the root-growth of wheat seedlings, and the inhibition of cell-division in fern spores[3] have been produced by neutrons in the same way as by *x* rays; a transplantable mouse sarcoma[4] has been destroyed *in vitro*; and skin epitheliomata and recurrent nodules of mammary carcinoma[5] have been made to disappear in the human subject. Though the biological effects of neutrons and *x* rays are thus similar, it does not necessarily follow that the mechanism of their production is identical. For accurate comparison measurement of dosage is essential. At the present time neutron dosage is conveniently expressed in roentgens, 1 *r* of neutrons being that dose which produces the same amount of ionization in the thimble chamber of a roentgen-dosimeter as would be produced by 1 *r* of *x* rays. It is then found that for equivalent doses in roentgens neutrons are more effective than *x* rays: for the Drosophila eggs they are 2.1 times more effective; for the wheat seedlings, 5 times; for the fern spores, 2.5 times; and for the lethal effect resulting from the whole-body irradiation of mice,[6] neutrons are four times more effective than *x* rays. It would therefore appear that the *relative* susceptibility of various cells or tissues to neutrons may differ much from their relative susceptibility to *x* rays, though the general order of radiosensitivity of cells (as first expressed in the "law" of Bergonié and Tribondeau) may be the same for both types of radiation. There are thus at the present time two ways in which radiotherapy with neutrons may be advantageous: first by the exploitation of these relative susceptibilities; and, secondly, by increasing the absorption of neutrons locally by a local increase in the concentration of light elements such as boron. This latter is a possibility capable of much easier realization than that of increasing the local absorption of *x* rays by the injection of heavy metals. For the future, there emerges also the question whether sufficient quantities of artificially radio-active elements can be produced in the tissues to be of therapeutic importance. There is one further important deduction to be drawn from Lawrence and Tennant's paper. They point out that, since neutrons per equivalent roentgen are four times more effective than *x* rays as regards the lethal effect resulting from whole-body irradiation, the average daily dose to the personnel working with neutrons should not exceed one-fourth of the tolerance dose accepted for *x* rays. Even so, whether daily doses of this magnitude over a length of time will cause damage is not yet known.

[1] *Phys. Rev.*, 1934, **45**, 608.
[2] *Proc. Nat. Acad. Sci.*, 1936, **22**, 124.
[3] *Amer. J. Cancer*, 1937, **29**, 556.
[4] *Proc. Nat. Acad. Sci.*, 1936, **22**, 543.
[5] *Amer. J. Roentgen.*, 1937, **37**, 289.
[6] *J. exp. Med.*, 1937, **66**, 667.

"Q" FEVER

One of the most encouraging advances made in the field of medicine since the war has been the gradual extraction of a number of definite infectious diseases from the rubbish heap labelled Pyrexia of Unknown Origin. To the list of brucella, rickettsial, leptospiral, and filterable virus infections which have been identified by combined clinical and bacteriological investigation must now be added a new disease that has just lately been recognized in Australia.[7] In a recent account Dr. Derrick,[8] the Director of the Laboratory of Micro-

[7] *British Medical Journal*, 1937, **2**, 722.
[8] *Med. J. Austral.*, 1937, **2**, 281.

biology and Pathology of the Queensland Health Department, gives an interesting description of this new so-called "Q" fever, and Drs. Burnet[1] and Freeman of Melbourne, the former well known for his researches on filterable viruses, contribute an account of the demonstration of the responsible organism in the tissues of inoculated mice. The disease has so far been met with chiefly in abattoir workers and dairy farmers. It is characterized by an acute onset and a fever that tends to fall fairly rapidly after one to two weeks, or more gradually after three or four weeks; convalescence is of variable length, and so far no fatal cases have been recorded. The outstanding symptom is headache, which is very severe and may resist treatment for some days; a rash is uncommon, but may occur in the second week. The blood usually shows a relative and an absolute lymphocytosis. Ordinary bacteriological examinations are negative. The differential diagnosis has to be made from influenza, Weil's disease, enteric fever, typhus, and seven-day fever. The definitive diagnosis is made by the inoculation of guinea-pigs with blood taken from the patient during the first fortnight of the disease, or less often with urine during the later stages and the early part of convalescence. The guinea-pig develops a febrile reaction of abrupt onset and decline, lasting four to six days, and subsequently is immune to re-inoculation. If the guinea-pig is killed during the fever, its liver is found to be highly infective for normal guinea-pigs and for mice. Mice, like guinea-pigs, develop a non-fatal disease. Examination of the mouse's spleen seven to ten days after inoculation reveals the presence of intracellular microcolonies of Rickettsia-like bodies staining purple with Giemsa; the virus is believed to be a new type of Rickettsia. The Weil-Felix reaction, it may be noted, is completely negative both in man and animals. The epidemiology of the disease is still obscure, but now that it is possible to make a laboratory diagnosis with considerable certainty it should not be long before the mode of infection and spread is known.

[1] *Med. J. Austral.*, 1937, **2**, 299.

YELLOW BLACKBOARDS

Some six years ago, at the request of various interested bodies, the National Institute of Industrial Psychology began a series of investigations into working conditions in schools, utilizing the invaluable experience it had already gained in connexion with work in factories and offices. It started by examining the types of school buildings already in existence, and finally included such matters as a survey of sickness absences in various types of school and a study of the various systems of heating, ventilation, and lighting. The determination of the most suitable environmental conditions for children and teachers in the school became of increasing importance. In considering school equipment it was thought that no more fitting subject could be chosen than that familiar and somewhat formidable landmark in everybody's education—the school blackboard. Apparently, writing on a large piece of slate with a small piece of slate was the earliest attempt at blackboard instruction, and in imitation of the teacher the children did likewise on miniature blackboards, or slates, with slate pencils. The blackboard evolved to become what we all know it to be, and the children's slate became extinct, to be succeeded by white paper written on by pen and pencil. While it was recognized that the strain felt by children in copying from the blackboard might be due in part to the repeated movements of the head and the eyes and to changes in accommodation and convergence, it was thought that it might also be due to copying from a *black* board on to *white* paper. The National Institute of Industrial Psychology has now published a report, by W. Douglas Seymour,[1] which threatens to put the blackboard along with the slate among other educational vestiges. In copying from a blackboard children have to move their eyes from a black surface with a reflection factor of 10 to 15 per cent. to a white surface with a reflection factor of 85 to 90 per cent. The object of the work done by the Institute was to discover whether a board with a far higher reflection factor than the blackboard would enable children to copy from it more quickly and with less strain. As a white board would be likely to cause glare a light yellow board was chosen for the experiments. Blue was chosen as the colour of the chalk. Two methods—a laboratory reaction-time test and class-room tests—were used. An instrument was devised to record on a moving tape the times taken by adults to read successively exposed short syllables presented first in white letters on a black board and then in dark blue letters on the yellow board. The results showed clearly that the words on the yellow board were read more rapidly than those on the black board, the average difference being 15.4 per cent. In the classroom experiments the speed of copying the usual white letters on a blackboard was compared with that of copying dark letters on a light board. The tests were carried out in four schools in Barking and Ealing. A test passage of 100 words was written on the board and the children were told to read it right through and then copy it on paper. Three different methods of trial were adopted, covering over 1,000 cases and under ordinary classroom conditions. The results pointed definitely in the same direction: the children were found to copy nearly 10 per cent. more in the same time from the yellow board than from the black board. This saving in time, it is suggested, represents a material reduction in strain. Further investigation is being made of the most suitable materials from which boards of the colour found best from the visual standpoint may be constructed.

[1] *Improving the Blackboard.* By W. Douglas Seymour. National Institute of Industrial Psychology, Aldwych House, W.C.2. (1s. 6d.)

On February 14 Sir Arthur Keith is giving a lecture at the Royal College of Surgeons on "The Prehistoric People of Mount Carmel," when he will be presented with a bronze bust of himself, subscribed for by a group of his friends, to commemorate his twenty-five years as Conservator of the Museum of the Royal College of Surgeons.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

SALINE INFUSIONS

BY

HAMILTON BAILEY, F.R.C.S.

Rectal Saline Infusion

Rectal saline infusion has the advantage of simplicity: it requires neither special apparatus nor asepsis. A drachm of salt to a pint of water at a temperature of 115° F. is allowed to gravitate into the rectum through a funnel and tube connected to a catheter. The patient's hips are elevated, and the funnel is held at a height of two feet. The usual amount of infusion is half a pint every four hours.

The celebrated John B. Murphy of Chicago introduced continuous rectal saline infusion (proctoclysis), which was a distinct advance, especially in cases of peritonitis. Slow continuous delivery of the saline aided its absorption, and with less disturbance to a patient in a critical condition. Murphy emphasized that the height of the reservoir should not be more than one foot above the rectum (Fig. 1), that the delivery tube should be of comparatively wide calibre, and that his glass bulb with many perforations (Fig. 1, inset) should always be employed. *It is to be noted especially that in Murphy's apparatus there is no valve or dripper in the circuit; thus flatus can be expelled up the wide rubber tube into the reservoir.* These simple principles have not been fully appreciated, and need further diffusion among the medical and nursing professions.

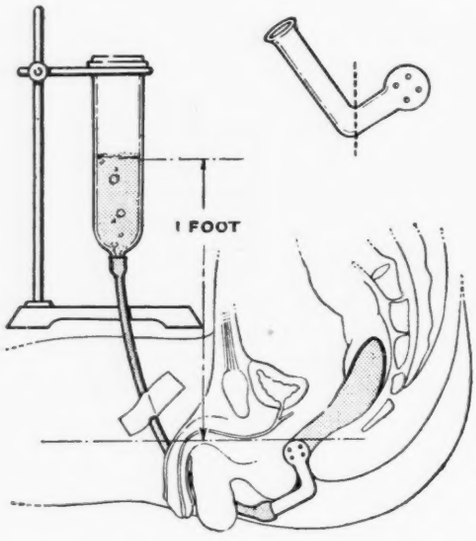


FIG. 1.—Diagram embodying the essential principles of proctoclysis as laid down by Murphy. Inset: Murphy's glass cannula; the part to the right of the dotted line lies within the rectum.

Many consider that the administration of saline by the rectal route satisfies almost every requirement. I have heard it said that if a mariner with "water, water everywhere, but not a drop to drink" were equipped with a funnel and tube he could absorb enough sea-water via the rectal mucosa to avert death for days or even weeks. Whether or not this is true, a close observer soon realizes that rectal saline, even when given by an experienced and painstaking nurse, is sometimes returned, particularly in cases where it is most needed. I am compelled to agree with Willard Bartlett of St. Louis that whoever wishes to adopt saline by the rectal route exclusively should first administer it a few times in person, and watch the results.

Summarizing, rectal saline is simple, safe, but slow and not satisfyingly certain.

Subcutaneous Saline Infusion

The apparatus for administering saline subcutaneously consists of two sharp-pointed aspirating needles which are attached to some form of infusion apparatus by a Y-shaped glass connexion. The subcutis beneath the breasts is usually chosen for the injection. The skin is sterilized and the sterile needles are inserted with the saline already flowing. They are kept in place with adhesive tape. The fluid should be at a temperature of about 112° F.; it cools considerably while passing through the tubes. The container is raised to a height of three feet, and the saline must gravitate at such a rate that there is no undue swelling of the subcutaneous tissues. It is often possible to give two or more pints of saline by this method without removing the needles.

This mode of administration of saline is inclined to be painful; it cannot be continued for more than a few hours; and the tendency is to replace it by the more certain method of continuous intravenous infusion, which can be administered without discomfort and with great precision.

Intravenous Infusion

Given in a massive single dose (a pint or more) intravenous infusion has many times saved life. True, saline and other isotonic solutions are but a poor substitute for whole blood, but occasions arise when urgency forbids the delay inseparable from blood transfusion. When a patient is collapsed his veins will be in a like condition, and it is necessary to insert a cannula into the vessel.

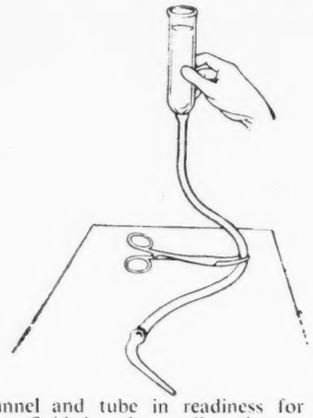


FIG. 2.—Funnel and tube in readiness for an intravenous infusion. Some fluid has been allowed to escape from the nozzle in order to be certain that there is no air in the tube.

Technique.—Before the vein is exposed the funnel and tubes should be filled with the solution. To ensure the absence of air in the tube and nozzle some fluid is permitted to escape. As soon as air-locks and bubbles are eliminated the tube is clipped (Fig. 2). A rubber catheter

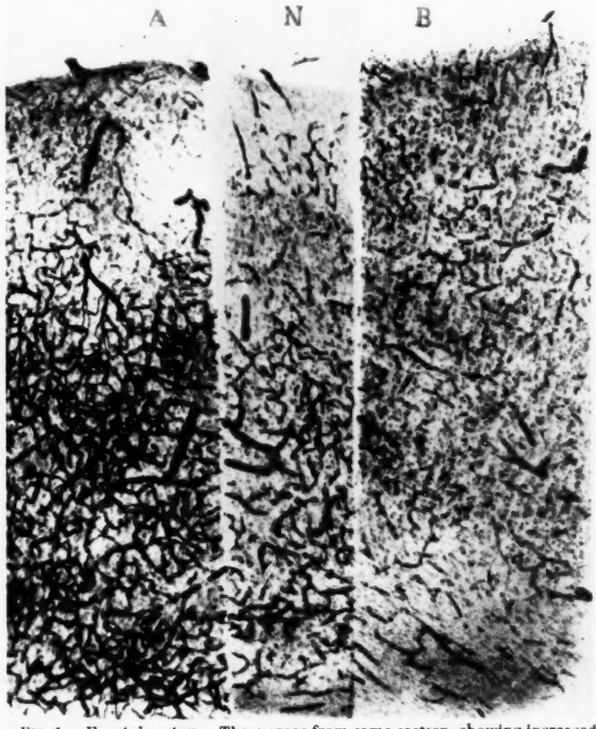


FIG. 1.—Frontal cortex. Three areas from same section, showing increased (A), normal (N), and deficient (B) blood supply. Ganglion cells are also shown. (Mag. × 32; 50μ thick.)

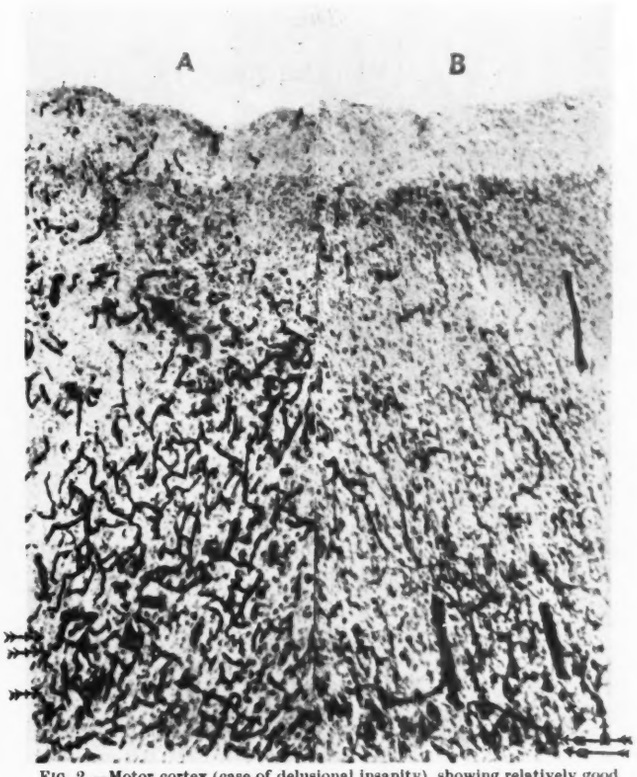


FIG. 2.—Motor cortex (case of delusional insanity), showing relatively good blood supply (A), and deficient blood supply (B). Compare the size of the Betz cells (marked by arrows) of both parts with the relative capillarity. (Mag. × 32; 50μ thick.)

FIG. 3.—Occipital cortex (case of schizophrenia). Note normal vascularity (A), and relative anaemia (B). Cells are quantitatively normal. The white band of Gennari is marked by an arrow. (Mag. × 32; 50μ thick.)

FIG. 4.—Cerebellum. Cortex of two contiguous lobules showing difference in vascularity. (Mag. × 60; 250μ thick.)

All the above are untouched photographic reproductions; each figure shows selected areas from the same section, the thickness being stereoscopically controlled. Author's stain technique.

P. R. ALLISON: HEALING OF EMPYEMA CAVITIES, WITH SPECIAL REFERENCE TO ASPIRATION AND AIR REPLACEMENT AS AN AID TO OPERATION

FIG. 1.—Radiograph of chest after aspiration of six pints of pus, showing mediastinal replacement and partial expansion of lung.

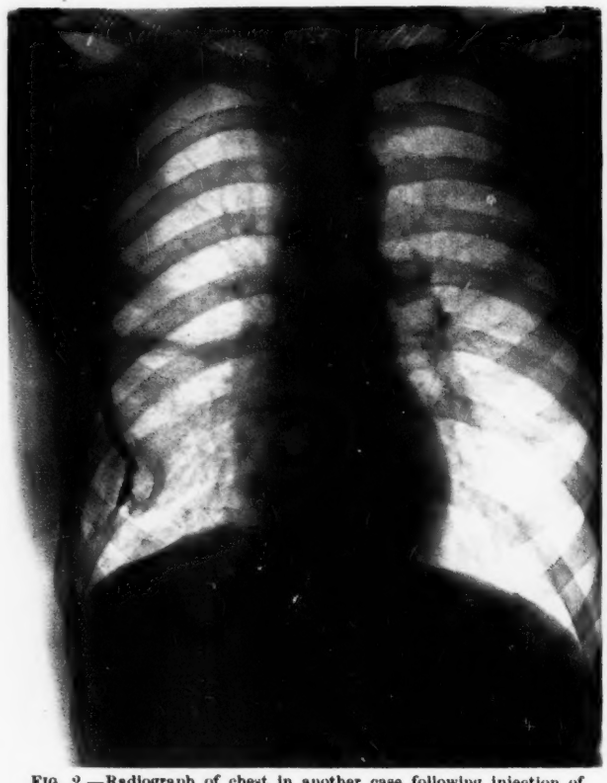


FIG. 2.—Radiograph of chest in another case following injection of lipiodol into sinus, showing thickened interlobar septum.

DOROTHY PRICE: TUBERCULOSIS IN INFANTS

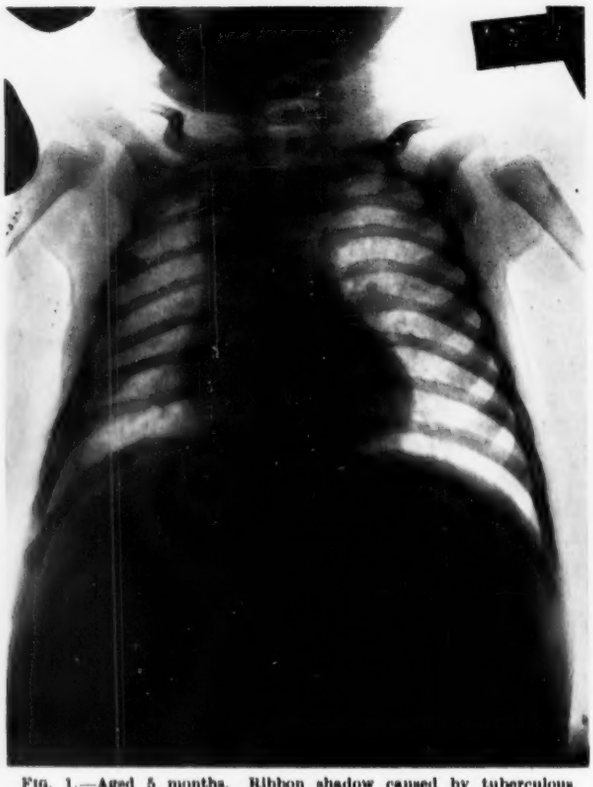


FIG. 1.—Aged 5 months. Ribbon shadow caused by tuberculous paratracheal glands. Child recovering.

FIG. 2.—Aged 10 months. Infiltration of right lung, accompanied by spina ventosa and multiple subcutaneous tuberculous abscesses. Cured two and a half years later, with radiograph clear except for a small calcified hilar gland.

D. J. HARRIES AND EMRYS WILLIAMS: AN UNUSUAL TUBERCULOUS APPENDIX

FIG. 1.—Photograph showing size and shape of appendix after hardening and mounting.

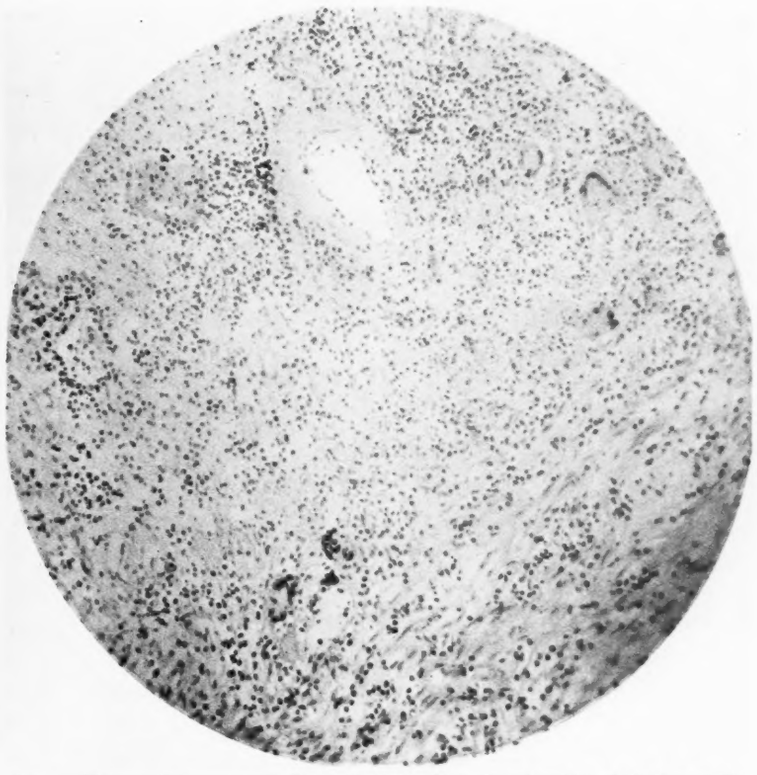
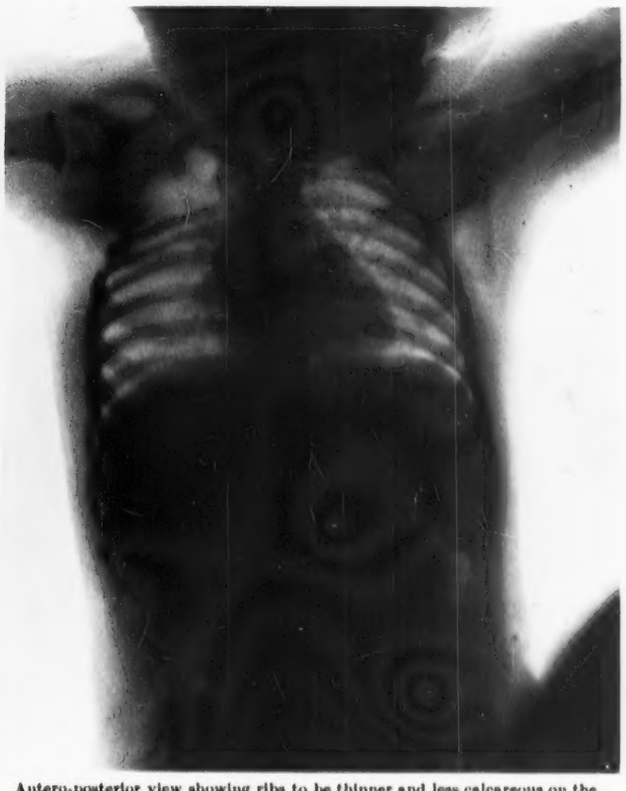


FIG. 2.—Microscopical appearance of a section taken from the cut surface of the base of the appendix.

H. BARSOUM: A CASE OF CHLOROMA

Showing the dura, seen from the inside with the tumour-like deposits.

W. A. BELLAMY: ABNORMALITY OF RIBS



Antero-posterior view showing ribs to be thinner and less calcareous on the right than on the left.

FIG. 1.—Right humerus before operation and before fracture.

FIG. 2.—Right humerus, showing union following fracture. Taken two months after operation.

FIG. 3.—Left tibia, showing cyst formation.

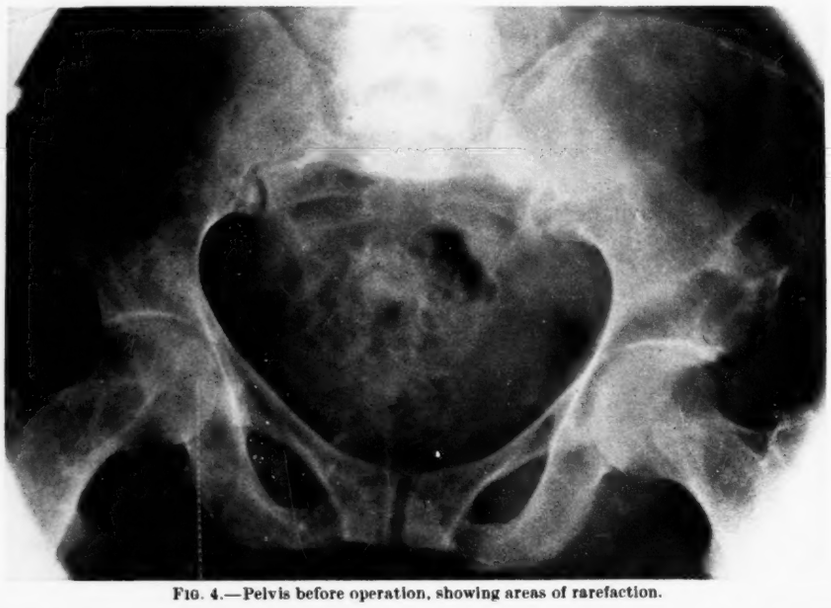


FIG. 4.—Pelvis before operation, showing areas of rarefaction.

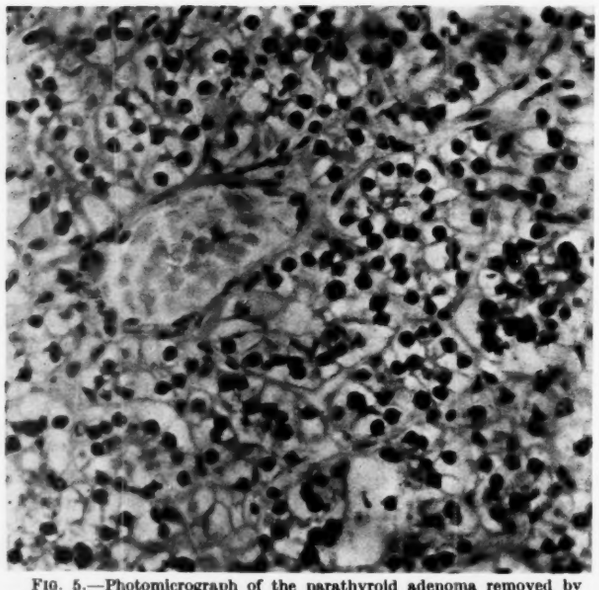


FIG. 5.—Photomicrograph of the parathyroid adenoma removed by operation. An alveola-like arrangement of the cells is well marked.

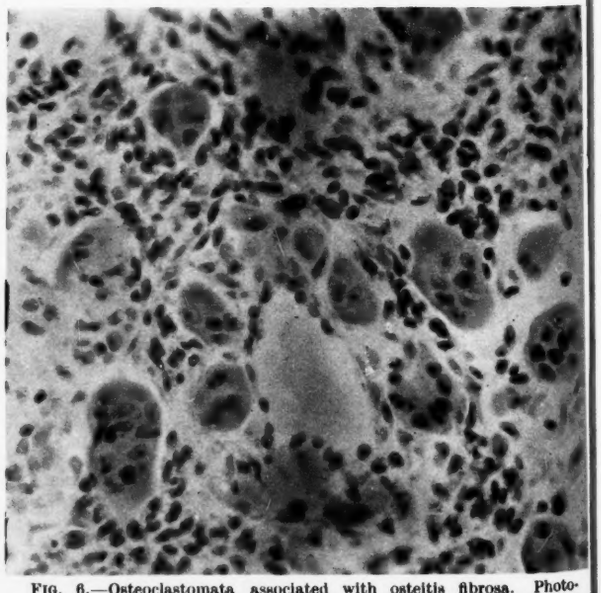


FIG. 6.—Osteoclastomata associated with osteitis fibrosa. Photomicrograph of tissue removed by puncture from the right humerus, showing the typical giant cells.

is placed round the arm. If the veins in front of the elbow are not visible the venous blood is milked upwards from the wrist. A folded towel is placed beneath the elbow to hyperextend the joint. If the patient is conscious a little local anaesthetic is injected into the sterilized skin over the vein. A short transverse incision is made through the skin, and the beak of a small haemostat is introduced into the wound and its jaws opened widely (Fig. 3). If this manœuvre is carried out once or twice the

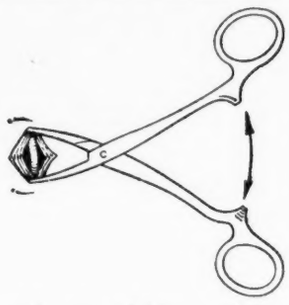


FIG. 3.—A rapid and efficient method of displaying a subcutaneous vein through a small transverse cutaneous incision.

vein will be cleared from the subcutaneous tissues better than by painstaking dissection, and there is no fear of tearing even a delicate vein. Two catgut ligatures are passed beneath the vein; the lower is tied and the ends are caught in the haemostat. Using gentle traction on the latter, a small transverse nick is made in the vein wall. The anterior wall of the vein is held up (Fig. 4) until the nozzle (through which the saline is now running) is within the lumen; then the proximal ligature around the vein and the nozzle within it is tied. After the administration, as the last ounce of fluid is gravitating into the vein, the cannula is withdrawn and the ligature surrounding the vein is tied quickly. Two skin sutures are required to complete the operation.

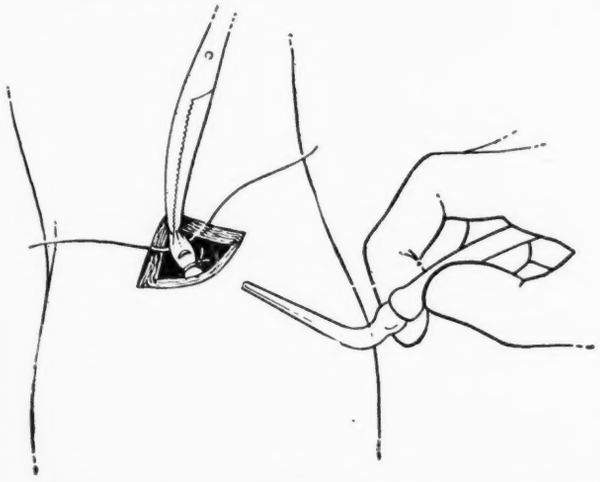


FIG. 4.—A vein exposed at the fold of the elbow ready for the insertion of the cannula.

Continuous Intravenous Infusion (Venoclysis)

Useful as is the massive dose of intravenous saline the indications for its use are limited. It must be borne in mind that unless there has been a corresponding loss it is manifestly unphysiological to put into the circulation a pint of fluid more or less suddenly. In shock, dehydration from vomiting, oliguria, and many forms of toxaemia, a slow continuous flow of saline intravenously approaches the ideal, for we know exactly how much fluid the patient is receiving. The fluid can be given over a period of days, and the rate of flow and the amount of fluid can be regulated with mathematical precision.

Continuous intravenous saline is valuable in the treatment of shock. In these cases an ampoule of coramine may be added to each pint of the saline solution with advantage. French observers have reported favourably on the results of adding adrenaline in doses of 5 minims of 1 in 1,000 solution to each pint.

Preparation of the Solution.—Obviously a solution which is introduced directly into the circulation must be absolutely sterile. But this is not enough: it must also be free from dead bacteria and other extraneous matter, such as fur from the sterilizer. Boiled tap-water does not fulfil these requirements, and reactions are bound to occur if it is used. Triply distilled water not more than a week old must be employed in all cases. It is, of course, equally important to have the sodium chloride sterile and pure. Tablets sold in tubes for the preparation of normal saline are not manufactured with a view to intravenous therapy. Sterile ampoules for making the solution are obtainable.* Leading manufacturing chemists now put up sterile normal saline in sealed litre bottles. When there is difficulty in obtaining fresh distilled water, and the facilities for sterilizing the somewhat bulky apparatus are not perfect (as in a private house), saline in this form, though comparatively expensive, has obvious advantages.

Saline or Saline and Glucose?—Normal saline solution alone meets most requirements. When glucose is employed we are introducing a substance into the circulation which requires katabolism, and if glucose is to be used there should be adequate reasons for its introduction: the patient must be in need of glucose, as one who has been starved, and only enough glucose for his immediate requirements should be introduced by the intravenous route. As regards insulin, if there is no reason to think that there is a deficiency of this hormone there is no need to give more.

Apparatus.—Special needles and cannulae for intravenous infusion are available. The ones shown in Fig. 5

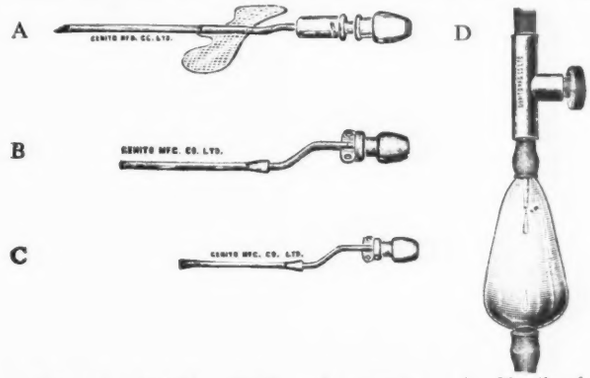


FIG. 5.—Author's needle and cannulae. A, Needle for insertion into a vein by puncture; B, Cannula; C, Cannula, child's size. All the above are gold-plated to prevent corrosion. D, An interceptor for continuous intravenous saline.

will be found to be satisfactory. Every portion of the apparatus (see Fig. 7) must be freshly boiled and washed through with sterile water or saline before the reservoir is filled. New rubber tubing should be boiled, stretched, and washed through to remove chemicals, and boiled again before the apparatus is assembled. An interceptor—Fig. 5 (D)—is an integral part of the armamentarium; it should be freed of contained water from the sterilizer before the reservoir is filled. The whole apparatus must

* The Crookes Laboratories, Park Royal, London, N.W.10.

be seen to be in working order and the filled reservoir suspended suitably before any attempt is made to prepare the patient for the reception of the saline.

TECHNIQUE

Choice of the Vein.—In general it is best not to use a large vein; one just a little larger than the cannula or needle is most suitable. A vein of the forearm is usually chosen. If no veins can be seen an incision should be made over the beginning of the internal saphenous vein; even in newborn infants one never fails to find this vessel just anterior to the internal malleolus. In patients who are restless, or may become so, the leg as a site for the infusion is preferable, for the lower limb can be splinted securely.

Inserting a Cannula.—In many emergency conditions the veins are collapsed; consequently it is necessary to expose the vessel. This is done through a small transverse incision, as already described. Full aseptic ritual must be observed, in the preparation both of the patient's skin and of the operator's hands; it cannot be stressed too often how vital it is for everything to be aseptic in this procedure. For subsequent smooth running it is recommended to flood the wound and moisten the cannula with citrate solution immediately before inserting the cannula into the vein. Once the cannula is satisfactorily in position the wound is closed about it. The cannula is now fixed to the skin by means of fine stitches passed through the slots near its base (Fig. 6).

Inserting a Needle.—If a needle, as opposed to a cannula, is chosen, it is a mistake to take the most prominent vein. One that is easily palpable but well obscured and supported by subcutaneous fat will be found to be less mobile and thus more readily entered. The large prominent veins of the aged are notoriously difficult to enter, and in these cases it is as well to transfix the vein transversely with a fine hypodermic needle before carrying out the puncture. The special needle is unfastened, the base being left attached to the tubing of the apparatus (Fig. 7). The needle is then placed on a Record syringe and a small amount of citrate solution is drawn up through the needle into the barrel. After a tiny nick has been made in the anaesthetized skin with a scalpel puncture of a vein is carried out, and this will be found easier with the syringe attached to the needle. In order to be certain that the vein has been entered blood is drawn up into the syringe, and a little citrate solution is then injected into the vein. The syringe is removed and the base of the needle connected to the adaptor at the end of the tubing. The needle is kept in position by suitable strips of adhesive plaster passed over the wings of the needle.

FIG. 6.

Keeping the Limb at Rest.—For the arm a posterior plaster strip well padded with Gamgee tissue with a turn around the wrist forms an ideal splint readily adapted to each individual patient. For the leg a posterior splint with a footpiece is very serviceable (Fig. 8). Alternatively, a Thomas's knee-splint can be used; this has the advantage of ensuring rigidity of the limb if the patient is inclined to be restless.

The Temperature of the Fluid.—In spite of the many ingenious devices that have been put forward for keeping the fluid warm the simplest appears to be the best—namely, the patient's leg or arm into which the saline solution is flowing is kept warm with a hot-water bottle

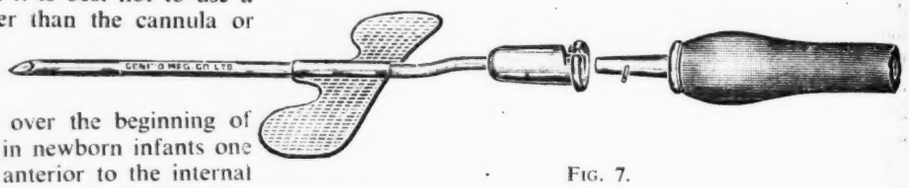


FIG. 7.

or an electric heating pad. In addition to simplicity this leaves the reservoir and the delivery tube in full view.

Rate of Flow.—The average rate of flow for an adult in need of fluid should be fifty drops per minute—that is, a quarter of a pint per hour, or six pints in the twenty-four hours. In urgent cases, for the first hour the rate of flow is often accelerated to 100 drops per minute to see how the patient responds. If the blood pressure is increased satisfactorily we are encouraged to proceed with the measure. When in doubt as to how much fluid the patient should receive the flow should be cut down to thirty drops a minute—that is, approximately three and three-quarter pints in the twenty-four hours—a dose which, at all events, is unlikely to harm him.

The Administration.—The actual administration is largely in the hands of the nursing staff. It is of paramount importance to be sure that the nurse appreciates the simple yet vital responsibilities connected with the care of the apparatus and the maintenance of strict asepsis. The nursing instructions are simple, and can be carried out by any conscientious State-registered nurse providing that she receives special instructions if she has not been trained in the method.

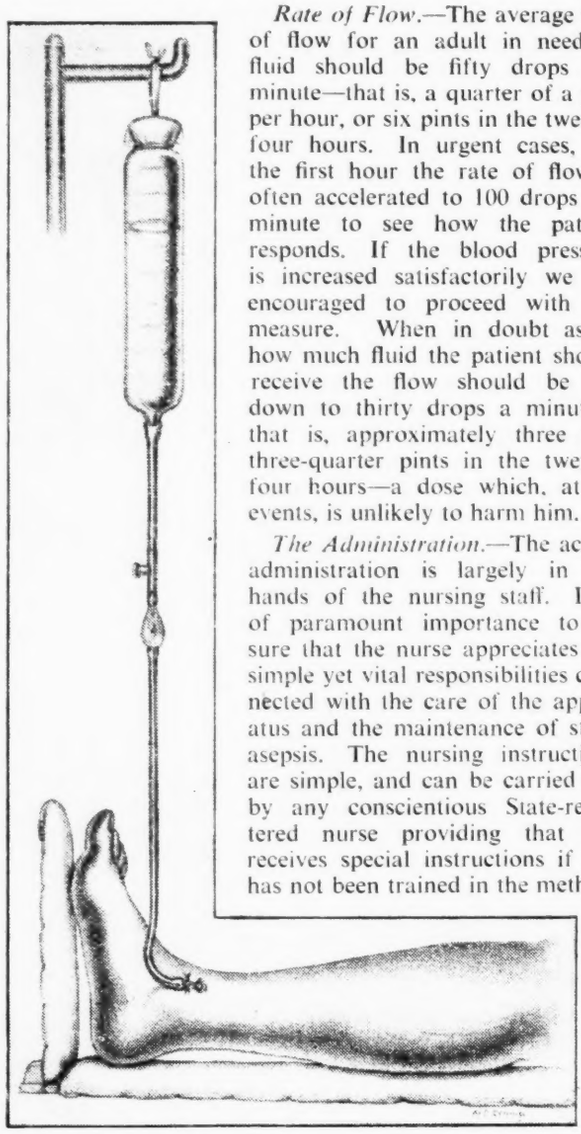


FIG. 8.—The apparatus in use In very ill patients who are restless or may become so the limb can with advantage be placed in a Thomas's splint. (This apparatus is made by the Genito-Urinary Manufacturing Co. Ltd.)

NURSING INSTRUCTIONS

1. Every utensil used in the transfer of the saline to the reservoir must be absolutely sterile.

2. To prevent the entry of bacteria from the air the top of the reservoir must be covered with sterile gauze.

3. The reservoir must always be kept more than half full of saline.

4. Veins are easily obstructed. There should be no bandage over the line of the vein.

5. The rate of flow should be timed and recorded at frequent intervals.

6. If the flow stops: (*a*) do not pinch the tubing; (*b*) see if the tubing is kinked; (*c*) if the flow is not restarted by some simple adjustment of the limb or the tubing report the matter at once.

7. Watch for and report immediately: (*a*) rigors; (*b*) redness along the vein; (*c*) oedema of the feet, face, or arms; and (*d*) any sign of respiratory distress.

8. Measure the amount of urine the patient has passed. If the output is less than the intake report the matter. Also report if the specific gravity becomes low.

Making up a Balance Sheet.—Unless a balance sheet is made up every twenty-four hours there is no check on the patient's requirements. I am definitely of the opinion that without a balance sheet intravenous saline should never be continued for more than twenty-four hours. To run in pints of fluid without keeping a check on its disposal is extremely dangerous. The balance sheet reproduced here is one that is extensively used.

CONTINUOUS INTRAVENOUS SALINE BALANCE SHEET

Patient's Name.....

24 hours ending 19	INTAKE	OUTPUT
INTRAVENOUSLY:		URINE (S.G.....a.m.) (S.G.....p.m.) .. pts.
*"..... drops per min. pts.		Vomitus .. .. .. pts.
*"..... " " pts.		Normally 1¾ pints—
"..... " " pts.		Faeces .. .. .. pts.
BY MOUTH		Sweating and Lungs—say pts.
Total		Total
GLUCOSE :—		
5% Solution (*allow* 30 *grams* = 120 *calories for each pint*) .....calories		
*50 drops per minute = 6 pints in 24 hours		
*30 drops per minute = 3⅜ pints in 24 hours		

CONTRAINDICATIONS

Continuous intravenous saline, employed intelligently, is an extremely valuable addition to the treatment of many urgent surgical conditions. The contraindications to its use are few, but they are definite and should be noted carefully.

1. *The Failing Heart.*—A history of dyspnoea on exertion, uncompensated valvular disease, or any possibility of cardiac weakness should call for hesitation in increasing the bulk of circulating fluid. When in doubt as to whether the poor pulse is due to cardiac weakness or to another cause, I have many times placed the patient on continuous intravenous saline and coramine, and waited for an hour or more to see if the blood pressure improves. If it does so, the flow is reduced to thirty drops per minute and the patient is again visited after a lapse of an hour or so.

2. *Pulmonary Congestion.*—In all conditions where there are signs of oedema or consolidation of the bases of the lungs the method is inadvisable.

3. *Hypertension.*—If the blood pressure is high it is obviously courting danger to burden the circulation still further.

4. *Bright's Disease* in all its stages is a grave contraindication. On the other hand, in obstructive anuria and oliguria, after the obstruction has been removed, and in many of the surgical uraemias, continuous intravenous saline or, better, continuous intravenous sodium sulphate (made by dissolving 42.85 grammes of Glauber's salt in one litre of water), used with discretion, is a real therapeutic advance.

RESEARCH IN LUNACY AND MENTAL DEFICIENCY

REPORTS TO THE BOARD OF CONTROL

The Board of Control issues its annual report in two parts. The first of these, for 1936, dealing mainly with administration and statistics, was reviewed in our issue of November 6, 1937 (p. 914). The second part,[1] a volume of 540 pages, which would be improved by an index, embodies brief records of research from mental hospitals. In appendices the Commissioners give an account of their visits to the various institutions. These accounts turn mostly on small details of administration, but this makes them none the less useful to those concerned. A list of institutions and approved nursing homes completes the volume.

A slight note of disappointment is struck because the scientific reports come from only forty-eight out of the seventy-five county mental hospitals, and from only fifteen of the twenty-five county borough mental hospitals, and in a number of these cases the communication is limited to a list of routine tests and examinations. But it is recognized that in several institutions the medical staff is numerically small, and it may happen that all available time outside daily duty in hospital has to be spent at out-patient centres. Eight hospitals, by the way, report on their out-patient work, one of them—the Isle of Wight county mental hospital—commenting at length upon its four mental welfare clinics, which 211 patients attended during the year.

But even lists of tests have an intrinsic value of their own, and their scope appears to increase. Attention is drawn to a very complete series of tests at Northampton county mental hospital which have been arranged for every newly admitted patient. In addition to the ordinary clinical examination and inspection by the dental surgeon and ophthalmologist, laboratory tests are made of the blood, urine, the cerebrospinal fluid if necessary, and the faeces, and an examination of swabs and sputum. This routine has proved of real therapeutic value by indicating lines of treatment, and has been the starting-point of other special investigations. It is mentioned that it is impossible to gather from the comparatively few reports on the subject whether or not the Wassermann test is applied to every new admission. At St. Andrew's, Northampton, reliance is placed upon the Meinicke reaction for syphilis; the Wassermann is not used at all, and in the opinion of the reporters there it should have been abandoned years ago.

Chronic Infective Processes

In the forefront of the report stands a long and important communication from the Joint Board of Research for Mental Disease (City and University of Birmingham). It is devoted mainly to the question of chronic septic foci in the head and neck as related to disturbance of the capillary circulation in the brain. A description is given of twenty-eight cases illustrating the relationship of mental disorder and oronasopharyngeal sepsis. The series generally illustrates the value of the removal of septic or irritative areas and the conversion of "closed" into "open" sepsis.

Parallel with this is an account from the Warwickshire and Coventry mental hospital of the treatment of 200

[1] H.M. Stationery Office. (8s. net.)

female patients suffering from various psychoses by the intravenous injection of typhoid-paratyphoid A and B vaccine. The conclusions reached are that T.A.B. vaccine is useless in schizophrenic and manic-depressive psychoses; that toxaemia as evidenced by confusion, occurring in association with any psychosis, may improve, but such improvement is uncertain; that pure toxic psychoses where bacterial infection is suspected as a primary cause do best, but treatment with this vaccine is only part of a general scheme, and that occasionally toxic-exhaustive patients who are severely ill derive tonic benefit from small doses.

Biochemical and Physiological Research

Looking at the communications as a whole, the main effort in research seems at present to be directed to chemical, biochemical, and physiological investigations. At Cardiff City mental hospital much work of this kind of high importance continues in progress. It includes work on narcotics and tissue oxidations, also on choline metabolism in the brain, with some interesting physiological findings. At St. Andrew's, Northampton, an investigation has been started on tissue culture of the nervous system in order to ascertain whether the method offers any promising lines of research into the functions of that system. The technical requirements are said to be difficult, but not insuperable. Numerous researches are being carried out at the Central Pathological Laboratory of the London County mental hospitals. One of them is on the selective vulnerability of the nervous system to various poisons and anaesthetics, a work of great importance which may extend over several years. Another is an investigation into the carbohydrate metabolism of various portions of the nervous system. One piece of work at this centre which has so far yielded only a negative result is an investigation into the possibility of the protection of mental hospital populations by administration of oral vaccines. So far the results do not give any reason for hoping for ultimate success in immunization by this method. One expensive and important research, assisted by a grant from the Rockefeller Foundation, consists in the production (in the course of treatment of general paralysis at Horton and Maudsley Hospitals) of therapeutic spirochaetocidal substances. The results are stated to be in process of publication.

Therapeutics

Some sixty or more items in various communications bear directly on treatment, and a dozen of these are concerned with the malarial treatment of general paralysis. At the Lancashire county mental hospital, Winwick, there has been a follow-up of old neurosyphilitics, only those cases which were admitted to hospital from ten to fourteen years ago, when the treatment consisted of malaria only, being included. The conclusions suggest that malarial therapy results in about one-third of the cases being discharged, and that whereas some 90 per cent. of non-treated cases die during the first two years after admission, half the treated cases live at least five years, and nearly a third a full ten years.

Prolonged narcosis as a line of treatment continues to receive much attention, and there are many references to somnifaine and other drugs. At Dorset county mental hospital a painstaking investigation into therapeutic narcosis with soneryl has been carried out, and a favourable report is given. The relative efficiency of luminal and prominal has been investigated at Warwickshire and Coventry mental hospital; the results of substituting prominal for luminal have been on the whole disappointing. From Newport, Mon., come observations upon the use of anti-rabies vaccine in epilepsy; two out of three cases showed some improvement mentally and a slight decrease in the number of fits.

Comparatively few psychological observations are recorded, though these include some very special ones from the psychological department at Bethlem. At Stoke Park Colony, Bristol, under the Burden Research Trust, some 3,500 normal school children have been examined and group-tested, and nearly half of them further submitted to the Binet mental tests. An investigation on inteiligence in relation to family size has been completed. From the Royal Eastern Counties Institution comes a study of mental ability in a rural community, with a view to investigating the effect of paternal occupation, illegitimacy, and parental consanguinity. This was an area in which two-thirds of the children belonged to a group interrelated by marriage, but this did not appear to affect intelligence as compared with unrelated children. No detail in mental medicine is frivolous, and therefore a note from Wonford House Hospital, Exeter, on the therapeutic value for women patients of a hairdressing room, where a permanent wave made melancholic and confused patients think they must be getting better, is worthy of inclusion among more highly scientific communications.

RESEARCH IN BLOOD DISEASES

Grants and Scholarships

The trustees of the Lady Tata Memorial Fund invite applications for grants and scholarships for research in diseases of the blood, with special reference to leukaemia, in the academic year beginning on October 1, 1938. Grants of variable amount are made for research expenses or to provide scientific assistants to senior workers. Scholarships are awarded as personal remuneration; their value will not ordinarily exceed £400 per annum for whole-time research, with proportionate adjustment for work on a part-time basis where this is approved. The grants and scholarships are open to workers of any nationality.

Applications must be submitted before March 31, 1938, and the awards will be made by the trustees in June. Further particulars and forms of application may be obtained from the secretary of the Scientific Advisory Committee, 138, Bedford Court Mansions, London, W.C.1.

Reports of Societies

SURGERY OF SYMPATHETIC NERVOUS SYSTEM

At a meeting of the Medical Society of London on January 24, with Mr. J. E. H. ROBERTS in the chair, the subject of discussion was recent advances in surgery of the sympathetic nervous system.

Dr. J. C. WHITE (Boston, Mass.) confined his contribution for the most part to a consideration of Raynaud's disease. He showed a series of photographs of successive phases of this condition—symmetrical colour changes, cyanosis, and excessive sweating. A large number of young people suffered from cold, clammy hands and feet—Uriah Heep was such a person: "His damp, cold hand felt like a frog in mine." In many the condition disappeared as they grew older, but in some it advanced into typical Raynaud's disease. It was important to note that many of these people showed excessive sweating, not of the whole body but of the hands and feet. Dr. White proceeded to give his results with lumbar ganglionectomy for Raynaud's disease in the lower extremities. The total number of cases operated on was eighteen, and the results, up to six years, were excellent in seventeen. One case gave a fair result; there was fibrosis from scleroderma. In a case which had been followed for six years the pre-operative temperature of the toes was 71.5° F.; the post-operative temperature was 93.2° F., and six years later it was 93° F. In preganglionic sympathectomy for Raynaud's disease of the hands the results in sixty-four patients, involving 106 extremities, were on the whole satisfactory. In forty-six of the extremities in which the disease was only in a mild form excellent results

followed the operative procedure in all but six ; thirty-one patients in whom the condition was moderate had all improved, and in the twenty-nine extremities in which the condition was advanced there was subjective improvement in about 50 per cent. In none of these cases had there been any complications.

Dr. White touched briefly on two other conditions—auricular paroxysmal tachycardia and auricular fibrillation. He related the case of a child of 4 whose paroxysmal tachycardia developed at the age of 2. Novocain injection of the left stellate ganglion was carried out, and normal rhythm was restored. In another case, a woman of 70 who had had paroxysmal fibrillation for four years, bilateral injection of the stellate ganglia with alcohol and novocain gave a year's freedom from the attacks. He also related the case of a man in whom pressure on the right side of the neck produced syncope. The condition cleared up after infiltration of novocain along the bifurcation of the carotid.

Sympathetic Ganglionectomy in Raynaud's Disease

Sir THOMAS LEWIS took up first the question of sweating in Raynaud's disease. It was not his experience that patients with this condition sweated freely on their hands ; many of them had hands of normal dryness. On the more general question, those who held that the vasomotor system was at fault believed that sympathectomy removed an abnormal vasomotor tone. While he agreed that sympathectomy was quite the correct treatment for many of these patients, he believed that it had its effect by removing not abnormal vasomotor tone but the normal vasomotor tone which almost everyone possessed, and it must have this tendency in cases of Raynaud's disease. Time had still to show whether sympathetic ganglionectomy, while it relieved these patients, could cure them. The rejoinder was made that when the ganglia were taken out a condition of hypersusceptibility to circulatory hormones was produced in the small vessels, and that if the operation failed it failed for that reason. When the argument was put in that way it must be disallowed. If it were true that the occurrence of the attacks in these patients was the result of increased susceptibility of the vessels to circulating hormones, then it would surely be true that all cases of sympathectomy, whether Raynaud's disease was originally present or not, would show Raynaud's phenomena subsequent to the operative procedure.

The fact of increased susceptibility of the vessels following ganglionectomy, to which he had drawn attention eight years ago, had been worked at considerably since then, particularly by Dr. White and his collaborators, and its results had been made the basis of Dr. White's later operative procedures. While he accepted the fact that the preganglionic operation was more beneficial to these patients, he did not believe that it was a better operation or gave greater relief than ganglionectomy. It did not touch the essential point that Raynaud's phenomenon was essentially local, due to a local cause. Some years ago he had stated that he did not think that, however extensive the operation of ganglionectomy was made, all cases would respond to it ; there would be many left in which improvement might be achieved, but not cure. He made the same prediction now with regard to the operation of preganglionectomy. He had examined four cases in which the preganglionic operation for Raynaud's disease had been done. In all these cases, shortly after the operation, he had been able to induce attacks in the hand ; he could not induce those attacks so readily as before operation, but he had not yet failed to produce a highly abnormal condition of the fingers. At the same time he had nothing but admiration for the enterprise which had led to these surgical operations, but on the question of the value of these operative procedures on the mechanism of the disease his original position was unaltered.

Surgical Intervention in Erythromelalgia and Other Conditions

Professor E. D. TELFORD spoke in particular of erythromelalgia, on which some work had been done in Manchester during the last few years. In 1878 Weir Mitchell published a paper on what he called a rare vasomotor neurosis of the extremities, and described a condition of hot burning feet, with pulsating arteries, dilated veins, intense pain on walking and standing, and intense hyperaesthesia. Twenty years afterwards James Collier followed with an account of ten cases of a similar type, but no real light on the subject was available until Lewis in 1933 published a long and careful observation and came to the conclusion that this was no disease but simply a susceptible state, that there were certain persons who had a threshold for warmth or heat which was much below the normal. Erythromelalgia was not a common condition.

A woman aged 22 was admitted to his ward with the story that since childhood she had been troubled with burning feet every summer, but in 1934 the condition persisted during the winter, and became so intolerable that she could not bear the bedclothes over the feet. The feet had the appearance of having just been removed from a hot bath. Various physiotherapeutic treatments were tried without effect ; the patient was discharged but returned in 1936, begging that something might be done to relieve her condition. It seemed unreasonable to do an ordinary sympathectomy, but when it was considered that the condition might indicate some lesion of the vasoconstrictor mechanism it seemed worth while to make a trial of the procedure. Accordingly a one-sided sympathectomy was done in July, 1936, and the attacks on the operated side ceased. He waited for twelve months before carrying out the operation on the other side : this was duly carried out in July, 1937, and since then both feet had remained perfectly well.

The case suggested that sympathectomy was certainly worthy of trial in these rare but distressing instances. The speaker also touched on conditions of excessive sweating, and mentioned some remarkable cases of profuse but strictly localized sweating. One of these was a meter inspector who had to walk twelve miles a day and who had sweating of the feet to such an extent that he had frequently to take off his boots and wring out his socks. A lumbar ganglionectomy resulted in an immediate cure, and six years after operation he was perfectly well. Sympathectomy was an ideal treatment for these rare and very troublesome cases of excessive sweating. It was true there was an alternative in *x*-ray treatment, but he considered that to be a little too risky and liable to result in fibrosis or even in malignant change.

Professor J. R. LEARMONTH dealt with the subject of sympathectomy as applied to the alimentary and urinary tracts. The clinical problem was to convert disordered transmission into ordered transmission, and incomplete evacuation into complete. He described the procedures which had been applied: for the urinary tract renal sympathectomy, division of the presacral nerves ; and for the colon, resection of the lumbar trunks, resection of the presacral nerve and inferior mesenteric nerves, or resection of the mesial branches of the lumbar trunks, this last the most selective and the least destructive. A proportion of good results had followed all the various types of operation he mentioned, and he advanced the view that at least in cases of achalasia there was room for the operation of sympathectomy as a part of treatment.

Discussion

Professor PATERSON ROSS said that they must all agree not only from the experimental point of view but from practical experience that preganglionic section was an ideal operation, but when it came to the treatment of Raynaud's disease—a special case—he agreed with Sir Thomas Lewis that there were disappointments in store for those who expected a cure. In his own experience, while many of the results were gratifying, others, for no

clear reason, were unsatisfactory. He had been much disappointed in one early uncomplicated case in which he was quite satisfied that he had performed the operation he intended to perform, but the woman still had to wear gloves while doing her housework. Mr. H. T. SIMMONS said that a series of patients had been tested for adrenaline sensitization before and after operation, and it was found that the sensitization decreased with time. In cases of Raynaud's disease clinical relapse began to appear six or nine months after the sympathectomy.

Dr. H. LETHEBY TIDY, as a student of Dickens, joined issue with Dr. White in suggesting that Uriah Heep wrung his hands because they were sweating The whole history suggested that Uriah Heep, a sexual depressive, was against the world, and the wringing of his hands was a psychological action. While he did not deny that sweating occurred in Raynaud's disease it did not always occur, and so far from the patients having a tendency to wring their hands they usually kept them quietly in a bent position.

Dr. WHITE, in reply, urged that sweating of the hands was a frequent symptom in Raynaud's disease, though he agreed that occasionally patients with entirely dry hands were found. Nine out of ten of the early uncomplicated cases, without sclerodermia and in young individuals, showed an extraordinary degree of sweating. As for Uriah Heep, Dr. Tidy had perhaps forgotten another significant reference: "His lank forefinger followed up every line as he read, and made clammy tracks along the page (or so I fully believed) like a snail"!

SKIN MANIFESTATIONS IN RHEUMATISM

At the Royal Society of Medicine on January 21 the Sections of Physical Medicine and Dermatology combined for a special discussion on the skin manifestations in rheumatism.

Dr. H. W. BARBER, after a brief survey of the subject, considered in detail the question of psoriasis in direct association with rheumatoid arthritis. Apart from the syndrome arthropathic psoriasis, rheumatic symptoms were common in psoriatics. As with rheumatism, the provoking factors in the skin condition clearly varied in different cases, and from the therapeutic standpoint there was as yet no specific treatment. For the present psoriasis might be regarded as a non-specific cutaneous reaction, the tendency to which was hereditary and familial in about 30 per cent. of cases. The eruption might coincide or alternate with various types of rheumatism—fibromyositis, rheumatoid arthritis, osteo-arthritis, and gout. Provoking factors apart from heredity might include environment, diet and errors of metabolism, and acute and chronic infections. A comparison might be made between the influence of a streptococcal infection upon psoriasis and its role in rheumatism. In rheumatic fever and in the psoriasis of childhood, streptococcal infection of the throat played a very important part. The two diseases might develop after a "silent" period of about one to three weeks following either tonsillitis or scarlet fever, and in both subsequent attacks of tonsillitis were followed by recrudescences even in adults. In rheumatoid arthritis and in psoriasis beginning in adult life, focal infection in the teeth, nasal sinuses, or elsewhere might be the chief provoking factor. On the other hand, in many adult cases of psoriasis there was no evidence that streptococcal infection played any part whatever, and the same was true of some cases of rheumatoid arthritis.

Psoriasis Arthropathica

Dr. Barber went on to say that apart from the association of psoriasis with various forms of rheumatic disease and gout, there was a syndrome—arthropathic psoriasis—which possessed certain distinctive features. The arthritis resembled clinically and radiologically atrophic arthritis, and the deformities might be very severe. One peculiar feature was the tendency to involvement of the terminal interphalangeal joints of the fingers and toes, which was rare except in severe and late cases of non-psoriatic arthritis, and the marked psoriatic changes in the nails adjacent to the affected joints. Moreover, intermittent hydrarthrosis of the larger joints was commoner than in non-psoriatic arthritis. In some cases focal streptococcal infection appeared to be the chief aetiological factor, as in one case observed in which infection from numerous dead teeth was unquestionably responsible for both the psoriasis and the arthritis, but in other cases this was not apparent.

In conclusion Dr. Barber touched upon other eruptions in association with gout, particularly a condition of the palms and soles which appeared to be a genuine gouty manifestation. It was characterized by an erythema of the palmar and plantar surfaces, extending on to the lateral surfaces of the hands and feet; by hyperkeratosis, occurring chiefly at sites of pressure; and by subjective symptoms of itching and burning. Although commonest in middle or late middle life, it might be met with in young adults and the aged.

Pigmentary Disturbances of the Skin

Dr. KERR PRINGLE, dealing with pigmentary disturbances of the skin, said that the frequency of concentrated patches of pigment occurring in cases of rheumatoid arthritis had often been pointed out. The dominant tints of the face were orange and citron, and a bronze shadow might be detected on the back of the hand. The unexposed parts of the body might be darkened in patches. Patients would say that the spots appeared at the same time as the rheumatoid symptoms. He had been on the look-out for many years for cases of rheumatoid arthritis presenting pigmented appearances, and he did not think these were as common as was supposed. He also mentioned Heberden's nodes, which were considered to be osteo-arthritic in nature. The initial symptom consisted of redness on the lateral aspect of the terminal joints of one or more digits. Occasionally rounded cyst-like bodies were seen, having the appearance of sago grains, on the knuckles of rheumatoid arthritics. These contained clear fluid, were not painful, and appeared gradually to become absorbed. He had no explanation to offer as to their nature. Patients with rheumatic disorder often stated that their chiropodist had told them that their corns and callosities or deformities of their nails were due to rheumatism. Was there any truth in that? He had always believed that corns and callosities were produced by friction or pressure, the most probable cause being badly fitting shoes or flat-foot. Nor could he believe that rheumatism *per se* had any effect on the nutrition of the nails. He made the further observation that many gouty patients stated that they were much better in general health when the skin condition was active. Treatment should be applied to the general condition—that is, the gout—rather than to the associated skin condition.

Relation of Psoriasis to Rheumatic Infection

Dr. ELIZABETH HUNT confined her remarks to some aspects of psoriasis and its relation to rheumatic infection. It had long been recognized that psoriasis was often associated with rheumatism of various forms occurring in the same individual or a near relative, but not many detailed records had been available. In 1933 she had published a series of fifty-three cases of psoriasis in which the family and personal history in regard to rheumatic manifestations was set out, and a family history of rheumatism, using the word in its broadest application, was obtained in a large proportion. This had been confirmed in a further twenty-two cases since that date. Out of the

total of seventy-five a family history of rheumatism was given in fifty-four. It was probable that the benign character of the psoriasis had diverted attention from its relationship to rheumatic affection. Psoriatic patients did not appear to develop mitral stenosis. For years she had been on the watch for a psoriasis case developing a rheumatic heart, but had failed so far in her search. The lesion in psoriasis and the rheumatic nodule evolved in a similar manner; the ultimate difference between them was attributable to differences in the types of cells concerned. Both lesions might persist to abscess formation, which in the case of the experimental rheumatic nodule had been shown to occur in a sensitive animal, proving that allergy played some part. In relation to rheumatic infections three features of the clinical manifestation of psoriasis were of special interest: (1) a latent period of some weeks between the time of the initial infection and the onset of the eruption; (2) the initial distinctive type of the eruption; and (3) the immunity in after-life from such internal complications as valvular heart disease, pointing to some special relationship between psoriasis and the rheumatic infection—a conclusion not invalidated by the fact that psoriasis could and did occur from other causes.

Treatment at Spas

Dr. WILLIAM YEOMAN confined his remarks to the treatment of cases at spas. Since the advent of light and *x*-ray treatment there had been a notable diminution of skin cases coming to spas. Shortly after the war and during the depression gout became a rare disease, and for some time hardly a case was seen at Harrogate Royal Baths Hospital. The beneficial effect of the waters of Harrogate was first produced by stimulating the action of the liver, and secondly by immersion in the waters. With acute gouty eczema it was impossible at first to give sulphur baths, but after a week or so a cautious start might be made. The association of rheumatism and psoriasis might be a coincidence, but when the two conditions did occur in the same subject there must be a common factor in causation. One frequently saw the rheumatism improving and the psoriasis getting worse, or vice versa, and it was usually the infective rather than the degenerative type of arthritis in these cases. Owing to the tendency of psoriasis to wax and wane it was difficult to assess the value of any treatment, but he felt that this condition was very suitable for treatment at a spa. He stressed the view that spa treatment acted by altering the metabolism of the patient, and was therefore more suitable for skin lesions associated with a disturbance of metabolism.

In the course of some general discussion Dr. N. BURGESS referred to the almost invariable affection of the nails in arthritic patients. In the treatment of psoriasis in acute cases with spreading lesions the appearance of new lesions was a contraindication to ultra-violet light; if new lesions were not appearing this form of therapy was exceedingly useful. Dr. AGNES SAVILL referred to a case in which there had been a steady improvement in the psoriatic condition with ionization. Dr. G. D. KERSLEY was surprised to hear Dr. Hunt's high percentage of family histories. He wondered what was taken as constituting a family history. It was a very common thing for people to reply in the affirmative when asked if they had a relative who had rheumatism. Dr. L. C. HILL said that, to illustrate the inadequacy of statistics, he had lately examined at his own hospital the statistics for gout over the last fifty years. The incidence varied enormously. For ten years it would remain at about 2 per cent., and then go up during the following ten years to 12 per cent. He discovered that the alterations in the percentages coincided with changes in the personnel of the staff. He had personally made a list of 140 cases of rheumatoid arthritis, and had found only two with psoriasis. Dr. HUNT described the care with which her assessment of family histories had been taken.

PRIMITIVE SIGHT AND HUMAN SQUINT

At a meeting of the Liverpool Medical Institution on January 20, with the president, Professor R. E. KELLY, in the chair, Mr. F. BERNARD CHAVASSE read a paper on primitive sight and human squint.

Mr. Chavasse brought forward evidence of the existence of binocular vision in all sighted vertebrates, and of its ultimate refinement, bifoveal vision, which was found not only in a small class of the mammalia but in some birds, reptiles, and even fishes. Overlapping was present in the binocular field of all vertebrates. No one had ever observed a purely monocular following movement in response to a purely monocular, visible, moving stimulus, even in the chameleon. It was safest to think of the "fusion" of the two uniocular patterns as a physical affair—a fusion in the appropriate oculo-somatic motor response. Similarly, a psychological cause was not required to explain the physical facts of the comparative anatomy of the optic chiasma. It was a matter of effecting an economy in the neuronic architecture required to produce the appropriate movement.

Evolution of Binocular Vision

The primitive vertebrate was as blind as a bat, which did not mean that it was unable to avoid obstacles, even in complete darkness, as a bat did. The barely defined visual fields of the two structures, which in a translucent body were as yet hardly eyes, had, if anything, a vague total overlap. By the time the fields became defined, with a maximum overlap where the prey was, the eyes had become well endowed with muscles. These muscles were developed to keep the eyes fixed relative to the panorama, in spite of movements of the head, so that from the first the two eyes were held in conjugate immobility under the influence of the compensatory (labyrinthine and "neck") reflexes. On the conjugated bi-retina fell various light stimuli, which came to be signals for the enhanced performance of reactions previously effected by non-retinal stimuli alone. He held that by applying three principles of Pavlov in the sphere of comparative physiology an orderly emergence of the various ocular reflexes could be traced; examples were given.

If binocular vision, so far from being the perquisite of man and the great apes, was so primitive as to be universal in the vertebrates, it followed that the developmental tendency towards it, manifest in the individual infant, should be very powerful. Its full development was ordinarily complete at the age of 3, and at the age of 6 or 8 years had acquired a certain unconditional fixity. If the eyes of an infant were forced into a position of squint they became confirmed in their faulty position by one or other variety of perverted binocularity. In the positive aspect of this (as distinct from the negative, amblyopic aspect) there developed, for instance, a perverted correspondence between the fovea of one eye and some eccentric spot with poor visual acuity in the other eye. The perverted reflexes were often perfected during the first three years of life and became hopelessly fixed at an early age. The eyes could be straightened for cosmetic or psychological reasons after this early age had passed, but the squinting eye was generally amblyopic. The ingrained perverted reflexes fought against the surgeon, tempting him into measures risking immediate or secondary divergence; there was as a rule no memory of normal correspondence to effect a physiological bond between the artificially straightened eyes, and it was much too late for such a bond to develop *de novo*.

Time of Operation

It was therefore often necessary, in cases not immediately relieved by occlusive and refractive methods, as well as in the great mass of unrecovered paralytic cases, to operate in very early childhood or in infancy, in order to give the ocular reflexes the chance of developing on

normal lines before their place had been usurped by ineradicable perversions. Photographs were shown of one of several operations which had emerged from these considerations, each designed to produce a particular effect and all specially evolved for treatment in earliest childhood and infancy. Mr. Chavasse said that he did not presume to ask for the acceptance at its first presentation of a novel view of development of the ocular reflexes, let alone for the universal adoption of particular operations by already experienced surgeons. But he did ask for the application by the general practitioner of a principle on which all ophthalmic surgeons were in solid agreement—namely, the immediate investigation of any case in which even the suspicion of an occasional squint had been aroused. Infants might squint from wind as adults did from anger, but as a rule the occasional glide meant that the ancient edifice of binocular vision was already rocking at its foundations.

In the discussion which followed, Dr. C. ALSTON HUGHES contrasted the demands of the new with those of the old methods of operating, and drew attention to the possibility of unpleasant subjective symptoms which might arise from hyperphoria following the more complicated methods, even when the cosmetic result was quite satisfactory. At the same meeting Dr. DONALD OWEN read a short paper on a case of hyperostosis frontalis interna.

Local News

SCOTLAND

Hospitals for Civilian Casualties in Air Raids

As announced in the *Journal* of January 22 (p. 182), the Government, with a view to making the fullest use in an emergency of existing hospital facilities and arranging for any necessary expansion, has decided that a comprehensive survey of the hospital accommodation of the country should be made. The Department of Health for Scotland, which is undertaking the survey in that country, has announced that Lieutenant-Colonel A. D. Stewart, superintendent of the Royal Infirmary, Edinburgh, and Dr. J. C. Knox, medical superintendent, Aberdeen Royal Infirmary, will assist the medical and other officers of the Department who have been detailed for the work. The survey will cover all hospitals and similar institutions, local authority or voluntary, and, so far as time permits, each institution will be surveyed by a medical officer and a lay officer in association. The country has been divided into Special Hospital Districts, and the officers responsible for each of these are: *Glasgow and the West:* Dr. T. Ferguson and Mr. J. Mason Allan; *Edinburgh and the South-East:* Lieutenant-Colonel A. D. Stewart and Mr. J. B. B. Brown; *Dundee and the East:* Dr. E. Watt and Mr. N. W. Graham; *Aberdeen and the North-East:* Dr. J. C. Knox and Mr. P. P. Kemp. *Highland Region:* Dr. Shearer and Mr. A. Smail. The General Board of Control for Scotland will be responsible for the survey of mental hospitals and mental deficiency institutions, and the inspecting officers will be the commissioners and deputy commissioners of the Board.

Canniesburn Hospital for Paying Patients

The auxiliary hospital and Merton convalescent home of the Glasgow Royal Infirmary, situated at Canniesburn on the outskirts of the city, was opened by Sir Iain Colquhoun on January 18. Sir James Macfarlane, who presided, said that in planning the section for paying patients they had borne in mind the possibility of extension, and the administrative block, kitchens, electric department, and heating installation had been devised on a scale well beyond the present requirements. The accommodation for paying patients comprised forty-six single rooms, two rooms for two beds, and four for four beds. The hospital stands in grounds extending to fifty-five acres, which were purchased and presented by Sir James Macfarlane and his brother, Mr. George W. Macfarlane. The building consists at present of three blocks two stories in height linked by covered corridors. The part for paying patients contains sixty-six beds and the convalescent home has accommodation for eighty beds. The charges to cover both maintenance and nursing will be at the rate of three guineas per week for a bed in a four-bedded ward, four guineas in a two-bedded room, and five guineas for a single room.

Gifts to Scottish Universities

Edinburgh University Court, at a recent meeting, gratefully accepted the gift of Dr. J. Donald Pollock of the premises formerly used as Bristo Church in the neighbourhood of the New University Buildings, to be available for the secular purposes of the University with special regard to the requirements of the Students Representative Council and of students' associations and societies. The hall is to be known as the Pollock Memorial Hall, in memory of the donor's father and mother. Dr. Pollock also presented a number of steel-framed plate-glass cases for the exhibition of specimens in the forensic medicine department. The Court also accepted the bequest of the late Sir John Thomson-Walker of a collection of 2,500 engraved portraits of medical men and a collection of books dealing with the history of medicine, together with a sum of £500 to provide accommodation for the collection. Aberdeen University benefits to the extent of half of the residue of the estate of the late Sir Ashley W. Mackintosh, who was Emeritus Professor of Medicine at the University. He left £35,482, and his will, in addition to providing legacies for the Aberdeen Joint Hospitals Fund, Maternity Hospital, and Royal Hospital for Sick Children, directs that the legacy to the University should be used "for the purpose of continuing and furthering the study and teaching of clinical medicine along the old-fashioned lines of Bright, Sydenham, etc."

ENGLAND AND WALES

Pathological Research in Leeds University

In their annual report for 1936 on the work of the department of pathology in Leeds University, Professors Matthew J. Stewart and J. W. McLeod indicate the continuous rise in the number of students attending the various systematic courses. The research work in progress includes the accumulation of data relating to the various forms of silicosis and silicatosis, and the question of the relative incidence of bronchial carcinoma in these patients continues to be studied. Some success has been obtained in the use of artificial light for the photochemical production of gold sols. Some patients with renal calculi were shown to have an increase in the blood calcium figure, which has been attributed to hyperparathyroidism. On the other hand, an increase of parathyroid tissue in certain cases of renal disease without calculi has been reported, rendering it possible that the hyperparathyroidism accompanying the appearance of calculi may be secondary to renal disease. This investigation has therefore been extended to include a study of the blood calcium content in various types of renal disease. No evidence has been obtained that the epithelial metaplasia occurring in the cervix uteri in disease, though simulating early carcinoma, is malignant or even pre-cancerous. Gold treatment of chronic arthritis and its effect on capillary endothelium and the blood continued to be investigated. A useful modification of the Weigert-Sheridan method of staining elastic fibres has been devised, and has proved particularly useful for the detection of elastic tissue in the

sputum. It has latterly been recognized that the pneumococcus can produce a haemolysin which is as active as that of the streptococcus, and work on the differentiation of these two haemolysins is proceeding, one possible practical outcome being the production of a more effective streptococcal antitoxin than has yet been available. From the department of experimental pathology and cancer research Professor R. D. Passy reports that it has so far proved impossible to reproduce Fibiger's work on the association of cancer with the parasitic worm. Further support has been obtained for the hypothesis that cancer tends to start in areas in which defective blood circulation has been induced. At least one, and possibly two, hitherto unknown enzymes have been shown to be concerned in glycolysis in muscle extracts. No success was obtained from using colchicine in the treatment of naturally occurring tumours, and no evidence was obtained that the injection of prolactin or progestin could augment the effect of oestrone in the development of breast tumours in mice.

The New Westminster Hospital Medical School

The fine new quarters for the Westminster Hospital Medical School are now nearing completion. With the new nurses' home they form one large block on the west side of the open space known as St. John's Public Gardens, Horseferry Road, Westminster. The main hospital building is in course of erection on the east side of the large site that has been cleared. The medical school, with its nine stories, provides everything for study and indoor recreation that modern ideas demand. The basement contains a large lecture theatre to seat 250, gymnasium, billiard-room, squash racket courts, shower baths, changing and drying rooms, and a radon room. On the ground floor are the main students' common room, smoking room, and refectory. The library and museum and adjoining demonstration room are on the first floor, with galleries on a mezzanine. On the second floor are the main classroom, small lecture theatre, and administrative offices. The histological laboratories, workshops, etc., are on the third floor; the general pathological laboratory and directors' rooms on the fourth floor; the biochemistry department and post-mortem room on the fifth floor; the physics department and research room and the operative surgery room on the sixth floor; research laboratories, photographic rooms, animal rooms, and roof garden on the seventh floor. On the fifth and sixth floors there are also bedrooms for thirteen resident medical officers, with gas-fires and a constant hot-water supply to the washbasins in each, and two bathrooms. All money used for the furnishing and equipment of the students' rooms in the medical school has been specially subscribed for the purpose and has entailed no charge on the hospital's funds. The new nurses' home, admirably laid out and decorated, will be opened by Queen Mary on March 1, and the new medical school by the Earl of Athlone in April.

Fees for Anaesthetists at L.C.C. Mental Hospitals

The Mental Hospitals Committee of the London County Council, in submitting certain proposals relating to the medical staff at Maudsley Hospital, states that one of these proposals—regarding fees for anaesthetists—has a wider bearing on the mental services as a whole. It is proposed that the fee of one guinea a session hitherto paid to anaesthetists in connexion with minor operations at Maudsley shall be increased to accord with the fees payable in the hospitals service—namely, two guineas for visits of less than three hours' duration, three guineas for visits of three hours or more but less than four hours, and four guineas for visits of four hours or more. It is also proposed that this scale shall be applied generally in the mental hospital services with effect from January 1. Other proposals relating to Maudsley only are that the part-time medical officers for out-patient diagnostic work shall be employed for three sessions a week and paid at the sessional rate as fixed for part-time consultants in the general hospital service—namely, £275 a year. Two part-time medical officers are to be employed for the treatment of in-patients by psychotherapy, each for five sessions a week at a salary of £300 a year. A further proposal relates to members of the Maudsley Hospital staff who are granted leave to go abroad to study special problems of psychiatric treatment with the aid of grants from the Rockefeller Foundation or some similar source. On their return they are to be relieved of part of the routine clinical duty which ordinarily would absorb the whole of their time at Maudsley, in order that, in the mental hospital service generally, with its great wealth of clinical material, they may be enabled to follow up special lines of research and inaugurate methods of treatment based on their studies.

Central Midwives Board

At the January meeting of the Central Midwives Board for England and Wales approval as lecturers was granted to A. L. Gunn, M.D., F.R.C.S., Albert Davies, M.D., F.R.C.S., and Thomas Emmett Lennon, M.D. Approval for the purpose of providing instruction in the essentials of obstetric analgesia and in the use of a recognized apparatus was granted to the Leeds Maternity Hospital and the Leicester and Leicestershire Maternity Hospital. To a letter from the supervisor of midwives of a local authority, asking for a ruling on points submitted, the Board replied:

(1) That if a midwife having booked a case calls in medical aid on account of an abnormality during pregnancy and the doctor decides that it is advisable that he should attend at the confinement, it is in order for the doctor, with the consent of the midwife, to take over the case forthwith and for the midwife to act thenceforth in the case as a maternity nurse.

(2) That a midwife is not entitled under any conditions to issue a medical aid form in a case in which a doctor has already been summoned by the patient or her relatives or her friends.

In response to an inquiry from a local supervising authority the Board decided to inform the authority:

(1) That the Board has always held that a midwife, as in the case of a doctor, has the right to refuse to book a case which, on any grounds reasonable or unreasonable, she does not desire to attend; but that this view does not extend to patients on whom attendance may be demanded on humanitarian grounds or a case in respect of which the midwife, as regards attendance, owes a duty to some other body, person, or authority responsible for the provision of an adequate midwifery service.

(2) That the rules of the Board provide that if a midwife is summoned to a case of miscarriage she should not deal with such a case otherwise than as the assistant of a medical practitioner, except in an emergency when a doctor cannot attend.

Birth Control Report

The seventh annual report for 1937 of the National Birth Control Association (president, Lord Horder), with which is incorporated the Birth Control Investigation Committee (chairman, Sir Humphry Rolleston), records the visit of a joint deputation on February 2 to the Minister of Health asking him to use his powers and influence towards the establishment by local health authorities of gynaecological clinics to deal with the medical care of married women, at which advice on contraception would be available to those women to whom further pregnancy would be detrimental to health. In May the Minister issued to maternity and child welfare authorities a circular (No. 1622) on maternal mortality. In this he stressed the importance of post-natal services, stated that post-natal sessions should be held at every ante-natal clinic, and mentioned the possibility of giving contraceptive advice at post-natal and gynaecological clinics. Following the issue of Circular 1622 a letter was sent by the National Birth Control Association to all maternity

and child welfare authorities which have not yet taken action under previous memoranda of the Ministry of Health. Out of 423 such authorities, ninety-five now have post-natal, gynaecological, or birth control clinics; eighty-six refer cases to voluntary clinics, private doctors, or hospitals; thirty-four give grants and/or lend premises to voluntary clinics; some do more than one of these things. In addition, forty-five stated that they give advice, but have no clinics or special arrangements; and 169 authorities do nothing. The report is issued from 26, Eccleston Street, London, S.W.1, and gives brief details of the year's activities and finance.

NEW ZEALAND

[FROM OUR CORRESPONDENT IN WELLINGTON]

Maoris and Tuberculosis

Tuberculosis in the Maori race presents a difficult problem. It is impossible to enforce the Health Act in small Maori settlements where housing and sanitation are primitive. Hutments now being supplied by the Government as an experiment represent a middle course between communal life, with its risks of infection by chance contact, and complete segregation of cases of active tuberculosis, which is objected to by the Maori people. The huts are not unlike those supplied to railway construction camps. Each has two windows and a fireplace. Except in the case of indigent natives the infected persons or their relatives are expected to provide suitable furnishing. The hutments will be under the control of the medical officers of health, and special nurses will make periodical visits to advise on any problems and watch the progress of the cases. Hitherto the tendency has been for patients who improve under hospital or sanatorium treatment to suffer a relapse on return to the native settlements. In spite of the tuberculosis menace the Maori population is increasing.

Medical Research

The Government has established a Medical Research Council under the provisions of the Health Act. A statutory function of the Health Department is to promote or carry out researches and investigations in matters concerning the public health and the prevention or treatment of disease. The members of the council are all medical except the Director-General of Scientific and Industrial Research. The council will act solely in an advisory capacity to the Minister of Health and will not control expenditure. *Ad hoc* committees will be appointed as part of the organization to supervise each investigation, and adequate funds will be provided by the Government. Preliminary work of investigation has already been done by way of research under the auspices of the Department of Health. Subjects for present and future investigation include nutrition, tuberculosis, goitre, dental caries, hydatid disease, cancer, and undulant fever. It is not intended by the council to provide funds for buildings, but, if approved, full costs of investigation will be allowed, including the salary of the research worker and the cost of equipment. From 1924 to the present time the Government provided only £13,239 for medical research in New Zealand, and the payments were intermittent. Now it is certain that medical research will be on a more definite and liberal plan and co-ordinated with similar research in England and in Australia.

The Pharmacy Industry

The Minister of Industries and Commerce in the Labour Government has provided a plan for the reorganization and control of pharmacies in accordance with the advice of the Bureau of Industry. This plan has been submitted to the principals of more than six hundred pharmacies in New Zealand, who must vote on the question. The basic points have been outlined as follows: ensuring the dispensing of standard quality drugs at reasonable prices by, or under the immediate supervision of, qualified pharmacists; retaining individual ownership and operation of pharmacies without preventing the properly controlled operation of company pharmacies with branch shops; the exclusion of wholesale druggists, manufacturing chemists, and oversea representatives whose industries may be the subject of separate plans. The Minister stated that "the plan does not propose to introduce at the present stage an official drug tariff and a standard dispensing fee and to require their compulsory observance, but it is recognized that when practicable those steps should be taken." It is also proposed to appoint employees as members of the Pharmacy Board. The Pharmacy Plan Industrial Committee is to have three members nominated by the Government, two by the Pharmacy Board, one from friendly societies' dispensaries, and one from employees of pharmacists. The Director of Pharmacy is to be appointed subject to the approval of the Bureau of Industry. Certain immediate advantages which pharmacists may gain by way of protection against competition may induce a majority to vote for this form of control of their business by the "socialization" of the means of production, distribution, and exchange. If the pharmacists take the Government into their businesses they will not easily get rid of Government control if they so desire at a later period. What is good for the pharmacists may be considered good for medical practitioners, so that the medical profession cannot remain unconcerned about these novel and apparently drastic "plans."

Hydatid Disease

The number of cases of hydatid disease in public hospitals in New Zealand last year was 133; the number of patients in their own homes and in nursing homes is not known precisely, although the disease is notifiable. The mortality rate is 16 per cent. The Royal Australasian College of Surgeons has established a register of fully recorded cases, which now number over a thousand in the register. New legislation has just been passed in New Zealand amending the Dog Registration Act with the object of checking the spread of hydatid disease. The Minister of Health explained to Parliament that the cycle of the disease from the sheep to the dog and from the dog to man was well known. The only certain remedy, he said, was for people to give up feeding raw livers and lights to dogs. Compulsion in this matter was not possible, but education of the public might be gradually effective. The amendment to the Act, however, provided the next best thing, and ordered a form of treatment which had proved useful in the Argentine, Nicaragua, and Iceland. In future, when dogs are registered the owners will be compelled to purchase arecoline hydrobromide and give this to the dogs at regular intervals as a vermicide. At the Royal Agricultural Show the Governor-General, Viscount Galway, called attention to the menace of hydatid disease, and made a special appeal to the farmers. There is no reason why, with proper supervision and the imposition, if necessary, of penalties, this disease cannot be completely eliminated from the country.

The following awards have been made to medical men from the fund placed at the disposal of the Secretary of State for the Colonies by the Trustees of the Carnegie Corporation for the purpose of enabling selected officers of the Colonial Service to undertake special courses of study: Dr. C. J. Austin (medical superintendent, Central Leper Station, Makongai, Fiji), for the study of leprosy in Egypt, India, Malaya, and the Philippine Islands; Dr. W. B. R. Jones (medical officer, Nevis, Leeward Islands), for a course in general surgery at the University of Edinburgh; Dr. A. H. Lowther (Malayan Medical Service), for studies in ophthalmology in Europe, India, and Egypt.

Correspondence

Schick Relapse after Diphtheria

SIR,—The interesting observation made by Dr. F. Pygott in your issue of January 15 (p. 120) moved me to look up some similar results recorded in 1931 in serum-treated diphtheria patients. Of fifty-three patients tested simultaneously with two different toxins between the twenty-eighth and fifty-fifth days after antitoxin, three were Schick-positive, and in fifteen tested after the fifty-sixth day five were positive, so that in sixty-eight patients the Schick reaction was positive in 11.7 per cent. after a definite attack of diphtheria. Our experience with the earlier prophylactics showed that antitoxic immunity to diphtheria is slow in developing. It may be suggested, therefore, that the same is true after the natural disease, and that if Dr. Pygott's and my own patients had been Schick-tested at a much later date the proportion of negative reactors would have been higher. Against that, however, we can set the figures of Ker and McGarrity (1924), who found that in 157 individuals with a previous history of diphtheria 46.4 per cent. were Schick-positive, and also those of Benson (1924), who reported that of 245 children with a similar history 48 per cent. were positive. Doubtless if accurate records pertaining to these histories had been available it would have been found that in not all instances was the diagnosis of the notified disease confirmed; but even making allowance for these a goodly proportion of indisputable cases of diphtheria would have remained, and it is a curious reflection that a natural attack of the disease should give inferior results so far as immunization is concerned to an adequate course of the most recent antigens. The plain fact is that second attacks of diphtheria are not uncommon, and this is not so widely appreciated as it might be. Such results as Dr. Pygott and I have quoted indicate their possibility. The practical points which seem to emerge from them are, first, that an authentic history of previous attacks should not be regarded as a ground for regarding immunization as unnecessary, and such subjects should be at least Schick-tested; secondly, that a definite history of previous attacks should not be regarded as excluding the diagnosis of diphtheria. In several instances in my own experience the results of such an assumption have been serious.—I am, etc.,

City Hospital, Edinburgh, Jan. 24. ALEX. JOE.

Early Diagnosis of Diphtheria

SIR,—The letter by Dr. H. J. Fardon in your issue of January 22 prompts a note on this problem so often discussed.

Some years ago an intensely interesting study of some thousands of cases of death from diphtheria was made in the U.S.A., the assumption being that if the diagnosis were made and a proper dose of serum given sufficiently early the mortality would be virtually *nil*. An attempt was made to find why the delays had occurred; naturally the largest percentage lay with the parents who failed to report "suspicious illnesses" sufficiently early. Dr. Fardon suggests that owing to our present medical arrangements delay may occur even after the doctor is called in. All the relevant arguments have appeared in your columns from time to time. If the doctor delays in giving serum he risks the life of his patient, for we know from carefully controlled animal experiments that if a certainly lethal dose of toxin is given very few hours remain in which even a huge dose of antitoxin given intravenously can save the animal. If, on the other hand, the doctor gives serum to a patient whose sore throat is caused by streptococci or Vincent's organisms, and the patient later suffers from serum rash, the doctor faces an awkward dilemma.

The whole solution seems to lie in very early diagnosis. In an ideal community the diagnostic laboratory would be open day and night, and the pathologist could report immediately that the smear showed predominantly diplococci and streptococci or Vincent's organisms. By the use of the Folger-Solé swab he could detect the presence of diphtheria bacilli in some cases within four or five hours, and then aid the practitioner. The provision of such diagnostic facilities would be somewhat comparable with the arrangement made in America for the rapid typing of pneumococci in pneumonia. It is for our medical leaders to consider to what extent such a scheme is practicable, for it would be costly and troublesome.

As a compromise it might easily be possible to include on the notification form for diphtheria a few questions to be answered by the doctor. When was the first visit made? How long had the patient been ill previously? When was the first dose of serum given? How much serum was given? Was a swab sent for diagnosis before serum was given, and when was it sent? The study of the answers to these questions by each M.O.H. and a periodical confidential report on the analysis to the whole of the doctors in the area would probably serve a useful purpose.—I am, etc.,

Jan. 26. BACTERIOLOGIST.

Silicosis Inquiry in South Wales: A Disclaimer

SIR,—During the past week several newspapers have published inaccurate accounts of the progress of the investigation into silicosis in the South Wales coalfield which is being promoted by the Medical Research Council with the assistance of their Industrial Pulmonary Disease Committee. These include a statement attributed to "a member of the Pulmonary Diseases Board" (apparently meaning one of the investigators working under the direction of the Committee) to the effect that the results of the inquiry will make possible an immediate reduction of over 80 per cent. in the incidence of silicosis in the anthracite coalfield. The facts are that the investigation is still in an early stage; that the results cannot yet be assessed; and that no such opinion as that purporting to be quoted has been formed. No interview has been given to the Press, and the alleged statement has not been made by the investigators.—I am, etc.,

E. MELLANBY,

London, February 1. Secretary, Medical Research Council.

Rehabilitation Centres for Injured Workmen

SIR,—This subject has been investigated by the Joint Committee of the British Medical Association and the Trades Union Congress, and the memorandum subsequently presented to the Government Interdepartmental Committee was very carefully prepared. The statistical estimates included in it are as exact as it is possible to make them, and the figures mean precisely what they say.

Rehabilitation Unnecessary.—A complete recovery and the return to original work is possible even without rehabilitation treatment, either because the injury is trivial or because the victim is not engaged in heavy industry, in 70 per cent. of cases.

Rehabilitation Necessary.—A complete recovery and the return to original employment is possible, if careful and expert treatment is followed by expert rehabilitation, in 25 per cent. of cases.

Vocational Retraining Necessary.—Even with the best treatment the patient will be permanently incapacitated from his work, and he must therefore learn a new trade, in 5 per cent. of cases.

There are two sources of permanent incapacity after bone and joint injury: (1) pathological changes over which the surgeon has little or no control, such as deprivation of blood supply of the articular cartilage of the carpal bones, head of the femur, astragalus, etc.; irreparable damage to the main vessels or nerves of the limb; and virulent infection beyond the control of conservative surgery; and (2) malunion due to imperfect reduction or redisplacement; non-union due to inadequate immobilization; joint stiffness due to injudicious splinting, passive stretching, continuous skeletal traction, etc. In the first group permanent incapacity is inevitable, but the proportion of cases in most fracture clinics is less than 5 per cent. The figure will obviously vary in different centres according to the relative number of major and minor injuries treated, but in the average city hospital in industrial areas the proportion should be within 5 per cent. In the second group permanent incapacity is not inevitable; it is the result of an avoidable error of treatment, and in past years this has been the most common source of disability, in some cases the figure for permanent incapacity in this second group approaching even 20 or 30 per cent.

That it is already inconceivable that treatment could ever have been so bad is a great tribute to the British Medical Association Fracture Committee, and to those few individuals who for many years have worked incessantly to improve the standard of fracture treatment in this country. But the goal is not yet reached, nor will it be attained by the establishment of fracture clinics alone. The success of the clinics will be judged by the extent to which they minimize the avoidable errors of treatment. The surgeon who adopts haphazard methods, who ignores radiographic control of treatment, who accepts indifferent methods of immobilization, and who blames his end-results on the fracture or the patient instead of on the treatment, will always find it difficult to believe that disability is inevitable in only 5 per cent. of injuries. When surgeons in charge adopt the principles of fracture treatment whole-heartedly, exercising the utmost vigilance, allowing no complication to pass unrecognized and uncontrolled, and inspiring every patient with enthusiasm, only then will avoidable incapacities be avoided. Unless this is done the rehabilitation centres, which we are determined to establish, will be faced with the same impossible task as the old massage departments.—I am, etc.,

Liverpool, Jan. 25. R. WATSON-JONES.

SIR,—Mr. Eastwood's letter in the *Journal* of January 22 (p. 202) is indeed timely, and raises many important issues on this subject. Nobody would seriously maintain that the percentage of incapacitated persons leaving a fracture clinic is as low as 5 per cent., nor is there the slightest hope that this figure can ever be remotely approached, let alone reduced. In all probability the fracture clinic figure of 5 per cent. mentioned in the memorandum of the Joint Committee of the British Medical Association and the Trades Union Congress is meant to suggest that this is the proportion of patients totally incapacitated by reason of fractures sustained during the course of their work. Even if this supposition is correct the figure is low, because there is no doubt that the industrial accident is often a very mutilating affair. The insurance combine's figures of disability quoted in Mr. Eastwood's letter are not high, and undoubtedly include cases of permanent total incapacity and also permanent partial incapacity. It should be borne in mind that an apparently trivial accident, or a fracture, which leaves even a trace of impairment of function may, in a skilled workman, result in a permanent partial incapacity sufficient to prevent him from ever again working with the same degree of efficiency.

Mr. Eastwood is perfectly right in suggesting that before schemes for the establishment of these centres are embarked upon reliable statistics should be obtained from all sources: from surgeons treating large numbers of fractures, from insurance companies, trade unions, etc. There is every likelihood that the results of work done in rehabilitating the injured workman may be disappointing for those who will be forced to provide the means for setting up and maintaining the centres if our profession persists in talking of percentages of cures which never have been, and never will be, attainable by any system of treatment.

My personal view is that the sympathetic employer is the best rehabilitating agent, but with labour as cheap as it is to-day and the rate of production so accelerated, even after a course of treatment at the best rehabilitation centre the maimed man, especially if he is getting on in years, will still have very great difficulty in resuming his place in the industrial scheme of things.—I am, etc.,

Manchester, Jan. 28. HENRY POSTON, M.Ch.

Safe Milk

SIR,—May a sanatorium worker express thanks to the British Medical Association for coming into the open at last on the question of safe milk? Every year this country spends hundreds of thousands of pounds on "curing" tuberculosis or dealing with outbreaks of milk-borne disease. Its efforts to prevent such troubles are less spectacular, scientists being less clamant than agriculturists. Housewives who strive intelligently to do the best for their families have been befogged by conflicting opinions: "Doctors tell you such different things," they say. This has been true largely because doctors are insufficiently interested in public health problems, and they themselves have been blown about by diverse winds of doctrine. To the British Medical Association's considered opinion, however, widespread respect is accorded, and it means a great deal to crippledom that the Association should have spoken with no uncertain voice.—I am, etc.,

Berks and Bucks Joint Sanatorium, Peppard Common, Oxon, Jan. 31. ESTHER CARLING.

Pasteurization of Milk

SIR,—When dealing with such an important article of diet as milk one should be careful to be not only accurate but in a position to prove statements made. Dr. Norman Macfadyen's letter (January 15, p. 148) leads me to think that he is "boosting" certified milk in preference to pasteurized milk. He does not distinguish between *B. coli* of a non-faecal type and *B. coli* of manurial contamination. This is an important consideration, since the *B. coli* found in pasteurized milk are almost invariably of the non-faecal type. A distinction between these two types of *B. coli* is rarely made, and this omission leads to misunderstanding and a general idea that all types of *B. coli* are of manurial origin. So far as the effect of pasteurization on tubercle bacilli is concerned, it has been

abundantly proved that a pasteurizing temperature much lower than 145° F. will be sufficient to ensure an entire freedom from tubercle bacilli. I am wondering how Dr. Macfadyen can excuse the presence of abortus organisms in certified milk.

Over a long series of investigations in the United Dairies laboratories 70 per cent. of herd samples of certified milk contained the abortus organisms of undulant fever. Of the same samples 63 per cent. contained the haemolytic streptococci of mastitis. I do not think anyone will suggest that the ordinary acid- and gas-forming organisms which are all included under the heading of *B. coli* are in any way comparable in their deleterious effects to these two organisms, *B. abortus* and the *Streptococcus haemolyticus*. The emphasis placed by certified milk producers on the gross bacterial plate count is not significant, since milk which has been pasteurized is entirely free from potential pathogenic organisms. A suggestion made in Dr. Macfadyen's letter that pasteurization is difficult to control is entirely unwarranted. The phosphatase test gives a complete control of the efficiency of pasteurization.

Dr. Macfadyen ends his letter by saying that "if a compulsory scheme were put into operation there would undoubtedly be a false sense of security." What alternative would he suggest? The only one I can see is that a standard of purity would be required that made it a penal offence to sell milk containing the bacillus of tubercle, *B. abortus*, and perhaps the mastitis streptococcus. Does Dr. Macfadyen demand a freedom to sell milk infected with these germs without penalty? Surely not. The United Dairies consistently apply a test of the bacterial content of pasteurized milk—namely, a plate count of milk samples, two days after bottling, taken from unsold supplies returned from the rounds. Two days is generally the longest period of storage of milk in homes. The results are convincing, and abundantly prove the efficiency of pasteurization. There is no question but that pasteurization is the only process which will ensure a supply of safe milk for public consumption.—I am, etc.,

London, S.W.16, Jan. 26. JAMES KIRKLAND.

Recovery in the Spinal Cord

SIR,—In the dissecting room and at surgical operations students are taught to preserve the nerves but to ignore the small blood vessels; this teaching, however, must not be generalized to the central nervous system. Mott's experiment (quoted in my paper in this issue) demonstrates the dependence of cord function upon the blood supply, and therefore a meticulous conservation of the small vessels is of primary importance in all operations upon the central nervous system.

The report of Dr. J. Purdon Martin's paper in the *Journal* of December 18 (p. 1242) includes in the consideration of requirements for recovery: (*a*) "interference with its circulation," (*b*) "scarring," and (*c*) subsequent "nutrition of the cord"; these are, however, subordinate to (*a*) severe cord damage, (*b*) glial overgrowth, and (*c*) provision of nutrient substances, respectively. The relation of the unfavourable prognosis of local syphilitic lesions and of intercurrent or chronic infections to vascular defect also is not made clear. Recovery of function in the cord is primarily dependent upon the restoration of blood supply to ischaemic areas.—I am, etc.,

F. A. PICKWORTH,
Director, Joint Board of Research for Mental Disease.

Northfield, Birmingham, Jan. 29.

Acute Appendicitis

SIR,—May I draw your attention to a point made in Dr. A. M. Spencer's interesting article (*Journal*, January 29, p. 227) on the aetiology of acute appendicitis? I refer to a sentence in the paragraph headed "National Distribution," which states that "in the villages of India and China the disease is unknown." This statement is an important, though perhaps not essential, link in his argument, and therefore deserves some comment. I believe that it has found its place in contemporary literature partly, at any rate, as the result of a paper by Weischer of Tsingtao, and I have seen this source many times referred to and copied.

I do not know anything about India, but it is true that appendicitis is not a common emergency in Chinese practice. It does not, however, follow that because cases of acute appendicitis are not often brought into hospitals, which are nearly always situated in towns, it does not exist in the villages. The large majority of Chinese peasants who come to hospital do so for economic reasons—they cannot do their work. In the mind of the Chinese peasant very few, if any, diseases are acute and require immediate intervention; the local resources must first be exhausted, and by that time the patient has either recovered or died.

The incidence of acute appendicitis in a well-established hospital increases slowly with a local realization of its gravity. Students who go home to their villages tell stories of patients with histories which are unmistakable, and needle marks in the right iliac fossa are common enough. This is the result of "needling", universally used to produce counter-irritation. I have more than once opened an abdomen to remove an appendix and found the caecum adherent to the anterior abdominal wall at the site of an old needle scar. Further, the incidence of appendicitis among a large student community eating Chinese food is, I think, about the same as that among the foreigners eating foreign food. Similarly, it was commonly said that tabes dorsalis and epidemic encephalitis did not occur in China. When the late Dr. Andrew Woods, neurologist to the Pekin Union Medical College, went out into the country to look for it he found a considerable number of cases.

The incidence of disease in China and other village communities is undoubtedly difficult to estimate, but there exists enough evidence to show that negative propositions such as the one to which I refer are based on inexact information, though they may or may not be partially true.—I am, etc.,

H. W. S. WRIGHT,
Late Associate Professor of Surgery, Cheeloo University, Tsinanfu.

London, W.1, Jan. 28.

Correct Footwear

SIR,—I should like to endorse Dr. Dorothy E. Mason's contentions regarding the requirements of the normal female foot (*Journal*, January 22, p. 203). In my student days Mr. E. K. Martin was able satisfactorily to demonstrate that "heels" were quite unnecessary. And ultimately a well-known London firm of shoemakers has been able to show that a "heel-less footprint shoe" need be neither spatulate, ungulate, nor rectangular, needing only to fit like a glove round the instep and heel and to leave the toes room to exercise. (An objection to heel-less shoes is commonly based on experience of the bedroom slipper—a sloppy object.) Elegant materials and craftsmanship can undoubtedly do much to mask any unorthodoxy. By taking weight off the toes and distributing it

naturally, even long hours of walking are devoid of discomfort; and, having no height of heel to step over, it becomes possible to catch the departing bus without having to prance or scuttle. In a small boat, where the need for security of foothold is already generally recognized, no one would dream of wearing heels. Really good shoes are always expensive, but these I have mentioned are considerably cheaper than are bespoke shoes; they are also better fitting, probably because it is impossible to persuade even a good bespoke shoemaker completely to abandon the type of twisted last to which he is accustomed.—I am, etc.,

London, W.1, Jan. 26. ALISON MACBETH, M.B.Lond.

SIR,—The recent correspondence about correct footwear seems to me to be an attack on shoe manufacturers rather than a considered survey of the situation. In the first place people who have never worn shoes can develop valgus deformity of the toes and even bunions. I have in my possession several prints of the feet of African natives which prove this. Secondly, shoe manufacturers now but rarely make shoes with an extremely pointed toe. When I was collecting material from a shoe factory for a lecture two years ago I was able to find only one model the inner border of which deviated sufficiently from the straight to be of use for demonstration purposes.

Raising the height of the heel and putting a relatively rigid sole on the shoe has resulted in a lack of exercise of the toes, and this has been responsible for a great deal of the valgus deformity which is blamed on the shape of the inner border of the shoe. Many people in England wear shoes that are too short for them. This is the chief factor in the causation of deformed feet. Shoes should be made in a sufficient variety of widths to enable everybody to be fitted with footwear of the correct length. This is an expensive and difficult thing to do; it is achieved in America, but American shoes are appreciably more expensive to manufacture and to retail than are our own.—I am, etc.,

Street, Somerset, Jan. 27. J. NEWMAN HEALES.

SIR,—I have followed with much interest the correspondence on correct footwear, and was especially interested in Dr. Dorothy Mason's letter in the *Journal* of January 22 (p. 203). I have been of the opinion for some time that the heel of a shoe is useless and a cause of much foot trouble. The heel originated as a *point d'appui* for the stirrup when riding. The only use that I can see for it is to provide a thicker part to reduce the wear at the point where most of the weight is taken by the shoe when walking. Now the heel, by displacing the centre of gravity of the body forward, causes a compensatory lordosis which the wearer retains during all his or her (especially her) periods of standing and walking. This cannot be anything but bad, and is in addition to the local damage to the foot. I have worn shoes without heels for about three years, and can testify to their very great comfort. I walk in them without fatigue, and am conscious while wearing them that the foot is working as a whole. Since taking to them my feet have developed such a flexibility that I can pick up a pencil with my toes with ease. These shoes are supplied by Messrs. Charles Baber, Ltd., 304, Regent Street, London, W.1, but they are unfortunately rather more expensive than ordinary shoes. Throughout the correspondence I have seen no allusion to the old type of open sandal; these are also to be had from Messrs. Baber, and are beautifully made. I have a pair, and during last summer I practically lived in them. They can be worn with or without socks, and are delightful without. These seem to me to be the ideal footwear for the warmer weather, since there is nothing to constrict the feet and they have all the benefit of fresh air. Fresh air is inimical to the growth of fungi, which are a cause of much discomfort, sensory to the sufferer, and olfactory to others. Some might say that sandals fail to give support, but normal structures need no artificial support, and most feet would derive great benefit from the exercise that sandals would permit. Another objection is that they might cause the arches to fall, but has not the conception of flat-foot changed during recent years, and do not our orthopaedists tell us that the trouble with so many feet is that they will not flatten? Satisfactory sandals are also made by Messrs. Clark of Street, Somerset, at a very reasonable price; these can be obtained almost everywhere. There can be little objection to the wearing of sandals in these days when transport is easy and when the streets and roads are so clean and well kept. The subject of correct footwear is one of national importance, and in the drive for physical fitness the Ministry of Health should turn its attention to the correct shoeing of the population. A nation with bad feet cannot be A1.—I am, etc.,

Dartford, Kent, Jan. 23. F. OLIVER WALKER.

Hydrotherapy for Rheumatoid Arthritis

SIR,—The report of the Health Resorts Conference at Bath contains extraordinary statements to which strong exception should be made. One speaker stated that "it was his considered opinion that no case of rheumatoid arthritis was suitable for a course of hydrological treatment so long as the slightest sign of activity still persisted." This is like waiting until a fire is well under way before sounding the alarm. To another speaker is accredited the statement that "no case of true rheumatoid arthritis in any active phase should ever be treated by hydrotherapy." Unless strongly contradicted these statements will destroy the last hope for thousands of patients. May I point out the treatment pursued at Halcyon Hot Springs, which has been the Mecca for rheumatics for fifty years.

Stretcher cases in the acute stage of rheumatism are immediately put into the pool, where they remain for twenty minutes. This is repeated from two to four times daily. Patients suffering from sciatica and other forms of neuritis may go in from eight to twelve times in the twenty-four hours. One speaker at the conference recommended "a depth of water of about 2½ feet and a temperature of between 90° and 100° F." The pools at Halcyon are 5 ft. deep, and large enough for swimming and exercise, which is insisted upon from the beginning. The temperature of the men's pool is 106°–108° F., and the women's pool is 102° F. These are the temperatures which have been found by experience to be the most effective.

All forms of rheumatism receive the same treatment. For, after all, rheumatoid arthritis is the severe form—the last stage—of the general disease. Every attack of rheumatism, however mild, is treated as a potential case of rheumatoid arthritis, and treated as such from the beginning. Exercise is necessary to maintain the joints in normal physiological activity. A strong indisposition to take exercise is a feature of rheumatoid arthritis which is the cause of endless trouble. Without exercise favourable results are impossible. Patients do better with a physician of the military type who manhandles his patients rather than the fawning type which hears and heeds every whim and fancy. Exercise is firmly insisted upon, and the direful result of neglect is clearly pointed out. We accept no excuses. Daily exercise is directed to stretch altered fibrous tissues and accustom them to movement.

Exercise may be painful, but it is necessary to break up and disperse fibrous masses.

It has been our aim to institute a routine for all forms of rheumatism which requires no expensive apparatus, medication, or medical supervision. In working out a routine treatment applicable to all rheumatic cases it has been our object to treat these unfortunates with the simple things, and the results, in our opinion, are worthy of record. A physician who waits until "the fire had burnt itself out and left only the charred remains in the form of distorted joints and twisted limbs" is failing in his duty to his patient. When the disease has reached that stage we tell patients that it is hopeless, and futile to waste their money in useless experiments. In rheumatism particularly, and in medicine generally, it is well to remember that

> A little fire is quickly trodden out,
> Which, being suffered, rivers cannot quench.

—I am, etc.,

F. E. BURNHAM,
Brigadier-General.

Halcyon Springs, British Columbia, Jan. 8.

The Problem of the Final M.B., B.S.Lond.

SIR,—The letters which you have been printing concerning the final M.B., B.S. examination are anything but complimentary to the Royal Colleges, and it is time that someone protested against such remarks being made by men representing a University which gives its students no real university life and can persuade only three-quarters of them to sit for the final examination. It will be admitted by most teachers that students who intend to take the M.B., B.S. can do so if given sufficient time, and also that a fair number of those who take the conjoint examination could pass the M.B., B.S. The leaders of our Royal Colleges should realize that at least a third of their students want a so-called university degree and are quite capable of obtaining one if given the chance to do so. I know that they can sit for the Fellowship or Membership examinations, but both these are specialists' diplomas. Why do not the Colleges obtain power to grant an M.B., B.S. of their own, making the examination a severely practical one open to men whose names have been on the *Medical Register* for a year or more? The general public would soon learn that here at last was a degree which was based on practical knowledge and not on text-book theory.

Every winter I engage an assistant to help run my practice, and I have had a number of graduates of various universities. It is unusual to find one who can advise a patient about diet, or who can deal with a difficult labour, or write a prescription, dispense a bottle of medicine, or even open a septic finger. This is a sad commentary on the teaching they have received and the degrees they have obtained. Perhaps the preacher was right when he exclaimed that of the making of books there was no end and that much learning was a weariness to the flesh. Perhaps he had foreknowledge of the M.B., B.S.Lond. when he summed up with the words "Vanity of vanities, all is vanity."—I am, etc.,

Ipswich, Jan. 25. C. S. STADDON, M.R.C.S., L.R.C.P.

SIR,—I submit that it is desirable to put on record the history of this controversy before taking final leave of it. A proposal that "the University might accept for the purposes of part of the M.B., B.S. degree the results of the Conjoint Final examination" was submitted to the Faculty Board in a memorandum dated January 11, 1937, by the then Vice-Chancellor, Mr. Eason (the present Principal), who stated that he had discussed this proposition "informally and unofficially" with the late Sir Edwin Deller, with Lord Dawson, with Dr. A. M. H. Gray, and with the then acting Principal. The memorandum may therefore be assumed to be the result of that joint effort, and Dr. Gray's chagrin at its failure becomes intelligible.

The motive given by the Vice-Chancellor for taking this action was the communication from the Court, quoted in my letter published on January 8, "with reference to the small number of students in medical schools who take a University degree." The Vice-Chancellor's argument for the proposed co-operation with the Conjoint Board was based upon certain figures in his memorandum, which were immediately demonstrated to be grotesquely erroneous. Many members of the Senate urged the desirability of having more precise knowledge of the facts before seeking outside advice, and a committee was appointed to investigate the present position. It is cheering to note from recently available figures that whereas the number of new candidates for the final Conjoint examination shows a considerable decrease—583 in 1936, 445 in 1937—the numbers graduating M.B., B.S.Lond. for the three years 1935, 1936, 1937, were respectively 144, 156, and 182—a progressive rise.

The Vice-Chancellor's memorandum was very carefully examined on February 23, 1937, at a full meeting of a subcommittee of the Faculty Board. The Dean of the Faculty of Medicine, who was chairman both of the Faculty Board and of the subcommittee, submitted a memorandum following closely the suggestions made in the Vice-Chancellor's memorandum but with somewhat more detail. A specific suggestion was made in the Dean's memorandum that a student having passed the final Conjoint Board examination and also the second M.B. examination should be granted exemption from the written papers of the final M.B., B.S. examination, but in order to qualify for the final M.B., B.S. should sit for a supplementary clinical examination three to six months after taking the final Conjoint Board examination. This memorandum also declared that "it is desirable that the M.B., B.S. examination should be held twice a year as at present"; a suggestion that that examination should be held four times a year was met with the significant objection, to which I would invite Dr. Colyer's attention, that this action would constitute "competition" with the Colleges and therefore was not to be entertained.

The report of the subcommittee was submitted to a meeting of the Board of the Faculty of Medicine on March 4, 1937. Although the Court had clearly shown it was willing to wait for the improvement expected from the new curriculum, which could not be manifest for at least five years, the Faculty Board considered the matter to be of such extreme urgency that they proposed to discuss immediately and directly with representatives of the Royal Colleges the scheme outlined above. It was only upon my representation that it would be imprudent to take such action before consulting the Academic and External Councils and the Senate that the Faculty Board finally resolved to follow the constitutional course I advised.

Dr. Gray is not quite correct in his description of the action taken by the Faculty Board. While, as he says, the Faculty Board came to no decision with regard to the suggestions outlined above, their report to the Senate states that "they regard them" (that is, the suggestions) "as being of sufficient importance for discussion with the Royal Colleges, and they therefore make the recommendation set out below: That the Board of the Faculty

of Medicine be authorized to discuss with representatives of the Royal College of Physicians and the Royal College of Surgeons the possibility of devising an alternative mode of approach to the M.B., B.S. degrees."

This recommendation met with a rough passage at the Academic and the External Councils, and subsequently at the meeting of the Senate on May 19, 1937. All that the latter body would sanction was "that the Board of the Faculty of Medicine be authorized to discuss with representatives of the Royal College of Physicians and the Royal College of Surgeons the problem submitted to the Senate by the Court—namely, the small number of students in medical schools who take a degree of the University of London." It is significant that whereas in March, 1937, the Faculty Board was in such haste to enter into negotiations with the Colleges that it was ready to commit the blunder of side-tracking the Senate, when the scheme met with the discouragement indicated by the Senate's variation of the Faculty Board's recommendation the Board suddenly lost interest in the matter. Although it was authorized as long ago as May, 1937, to consult with the Royal Colleges no effort to do so has yet been made. Dr. Gray is again inaccurate in his statement concerning my action with regard to the University of London Bill. That Bill became an Act in 1926, not 1927. It is true that I opposed the second reading of that Bill without, however, pressing my opposition to a division. But certain assurances given during the debate by the Chairman of the Departmental Committee which had prepared the Bill, and later, and still more authoritative, assurances given during the committee stage by the Minister in charge of the Bill, prevailed with me in accepting in committee the new position created by these assurances, and I received the thanks of the Minister. Moreover, I refrained from opposing the third reading. I have not, however, concealed my regret at certain results of the Act, notably the removal from the Senate of the representatives of the London County Council and of the Inns of Court, bodies which had sent to the Senate many outstanding personalities, among whom may be mentioned Sidney Webb, W. J. Collins, Gilbert, Warburg (L.C.C.): Moulton, McNaghten, Swinfen-Eady, Russell, McCall, Cozens-Hardy, Atkin, Tomlin. Their elimination is not, I submit, compensated, in the opinion of the great majority of the Senate, by the addition of the Deans.—I am, etc.,

House of Commons, Feb. 1. E. GRAHAM-LITTLE.

Time for Midwifery

SIR,—A Sunday newspaper has recently published an article on maternal mortality. It was a good article, and said in effect: "It is a year since the maternal mortality report was issued; why has nothing been done?" The public have very good reason for dissatisfaction. The maternal mortality report, 1937, tells us that many women are killed and many more terribly injured in their confinements without due cause, and it sums up the situation very well on page 193: "When due allowance is made for maternal deaths which cannot be averted the fact remains that the present position of midwifery practice in this country cannot be viewed with equanimity." This is no exaggeration; this is true and admitted to be true by all men of honest minds.

Failed forceps cases are still being admitted to our maternity hospitals and cases of eclampsia are not unknown. Gas-and-air analgesia has been in use with great success in some hospitals for over four years, yet I find that in many districts within a hundred miles of London no serious attempt whatever is being made to make gas and air available for all women. We must face the fact that, as the report says, "inexpert midwifery is a factor of major importance." There is one basic reason for inexpert midwifery and one reason only—want of time.

Since the introduction of the National Health Insurance Act the insurance practitioner with even a moderate panel finds, so great are the demands made on his services, that he simply has not got the time to give to midwifery. There is a solution of our difficulties—a full-time maternity service—and there is no reason why this should not be immediately established on a voluntary basis. In nearly all districts now there are women practitioners, and as women doctors seem to have a special aptitude for midwifery we should say to our women colleagues: "We intend to send you all our midwifery cases, and we shall ask you to respond to the midwives' call for medical aid." Soon they would be doing nothing but maternity work, greatly to the benefit of the patients.

If the medical profession had been willing to co-operate with Mr. Lloyd George we should have obtained a satisfactory National Health Insurance Act, so let us be warned by the fate which overcame us in the past and before it is too late build up a maternity service which will be a credit to our profession.—I am, etc.,

New Barnet, Jan. 28. JOHN ELAM.

The Radiologist's Range of Service

SIR,—Once again the question of ownership of *x*-ray negatives has aroused much interest and comment. I am not so much concerned with this problem as with the implications contained in the following sentence from Dr. C. H. C. Dalton's letter (*Journal*, January 22, p. 206): "Every specialist of experience acquires a reasonable knowledge of the work carried out by those of his colleagues with whom he associates, *and I am constantly called upon by medical practitioners, particularly in the country, to decide whether or not a bony injury requires the services of a surgeon.*" (Italics mine.)

All fractures require treatment, and the appropriate treatment for any individual fracture can be determined only by the experienced surgeon who has before him all the facts, clinical and radiological. Years of observation of combined clinical and *x*-ray results enable him to advise: "This fracture requires reduction": or: "This fracture will give a perfect result with splintage only if a certain programme be followed," and so on. But a radiologist has neither the special training nor the wide experience which enables him to speak with authority on clinical end-results; and he has no responsibility for the welfare of the patient. Thus it is quite unfair to him and to the patient that he should be asked to express any opinion on the *treatment* of a fracture. I believe that a radiologist is entitled merely to report the presence or absence of fracture, and the presence or absence of displacement. His position does not entitle him to do more—certainly not to deny the patient the benefit of competent surgical advice.—I am, etc.,

Manchester, Jan. 31. H. OSMOND CLARKE.

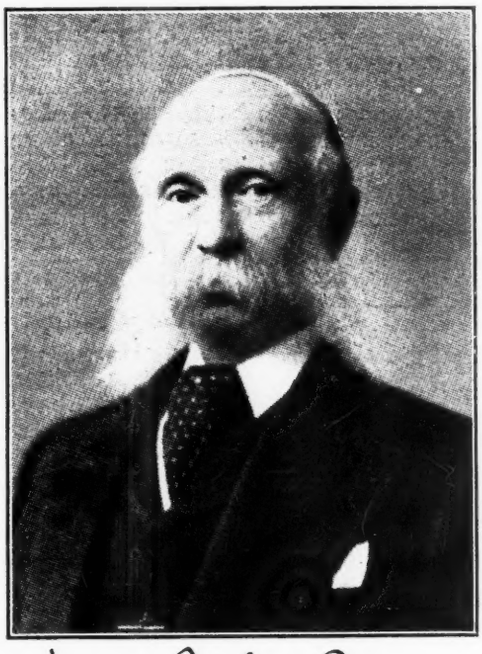
It has been announced in the *Yorkshire Post* that a proposal is under consideration for the provision in Leeds of a new radium institute to meet the needs of the West Riding. The scheme has been put forward by the West Riding County Council, the Leeds City Council, the General Infirmary at Leeds, and the Yorkshire Council of the British Empire Cancer Campaign.

Obituary

SIR JAMES CRICHTON-BROWNE, M.D., LL.D., D.Sc., F.R.S.

Formerly Lord Chancellor's Visitor in Lunacy

We deeply regret to announce the death at Dumfries on January 31 of Sir James Crichton-Browne at the advanced age of 97. In his passing from our midst, not only does psychiatry lose an honoured and distinguished leader, but the profession as a whole mourns the loss of an illustrious physician and a wise counsellor and friend. His venerable and commanding presence; the charm of his manner and the richness and force of his oratory; his clinical acumen and his practical sagacity; his unflagging interest in all that appertained to the world of medicine and of literature; and his great goodheartedness, rendered him alike a unique and unforgettable figure in the annals of contemporary medicine.



James Crichton-Browne was born on November 29, 1840, at St. John's Hill, Edinburgh. His father, Dr. W. A. F. Browne, Commissioner in Lunacy in Scotland, had been the first medical superintendent of the Crichton Royal Institution, Dumfries, and was not only an eminent psychiatrist—he was President of the Medico-Psychological Association in 1866—but a man of wide culture and of high scientific attainment. His mother also was highly gifted. Few knew their Shakespeare and their Burns as she did; and fortunate in the possession of an exceptionally good memory, she was in the habit of reciting to her son by heart whole passages with whose beauty she was desirous of impressing him. Many eminent men of letters—Dr. John Brown among others—used to foregather at their table; and thus it was that the son came early to nourish that love of literature and rhetorical skill which later he was to put to so good a use. Educated at Dumfries Academy, and later at Glenalmond, Crichton-Browne entered the University of Edinburgh at the age of 17. It is interesting to note, as witnessing his early bent towards matters psychological, that while still a student he read before the Royal Medical Society a paper entitled "Psychical Diseases of Early Life." He qualified L.R.C.S.Ed. in 1861, and took the M.D., with honours, in 1862. He was elected by his fellow-students President of the Royal Medical Society.

On graduation his interests in cerebral physiology and in psychology were already declared; and his apprenticeship in the study of mental medicine was served successively in the County Asylums of Derby, of Devon, and of Warwick. In 1865 he was appointed superintendent of Newcastle City Asylum, which post he relinquished to become medical director of the West Riding Asylum at Wakefield. There he instigated work which exerted a profound influence upon the development of psychiatry and neurology in this country. At the outset he recognized that, while there was abundant material for investigation in asylums, there were but few facilities for medical officers to undertake research work. He recognized, moreover, that the failure to produce such work was partly due to the absence of any stimulus to the arrangement and elaboration of the material collected, and to the want of a channel of exposition. It was with a view to supplying this deficiency, and of affording an incentive to the utilization of much valuable information buried in case-books, that he projected the *West Riding Asylum Reports*, the early volumes of which have now become psychiatric classics. The first of the series was published in 1871. Crichton-Browne established at Wakefield the first neurological research laboratory in the Kingdom, where Sir David Ferrier was enabled to carry out his experiments on cerebral localization. The *Reports* contain the results of these experiments, as well as many other contributions from Hughlings Jackson, Clifford Allbutt—at that time a physician at Leeds Infirmary—Lauder Brunton, William Turner, and Bevan Lewis, then a medical officer at the asylum and later medical director. For a time Wakefield Asylum was the centre of neurological interest, and many eminent men congregated there and made their contributions at the monthly medical conversaziones which were organized at that institution by its director. The pioneer work thus begun has had far-reaching results, and so far as Wakefield itself is concerned the tradition for research set up by Crichton-Browne has been ably upheld by his distinguished successors, Herbert Major, Bevan Lewis, and Joseph Shaw Bolton.

In 1875 Crichton-Browne was appointed Lord Chancellor's Visitor in Lunacy. Everywhere the appointment was recognized as a fitting tribute to his energy and genius in the study of insanity. To commemorate the occasion a complimentary banquet was held, presided over by Lord Houghton, and fitting acknowledgments were made of Crichton-Browne's arduous labours at the West Riding Asylum and his enthusiasm for lunacy reform. Some two years later he sat with Dr. Hughlings Jackson, Sir John Bucknill, and Sir David Ferrier as member of a committee to consider the establishment of a special journal devoted to neurological research. The following year saw the foundation of *Brain*, which, in spite of many early vicissitudes, lived to uphold the traditions of British neurology and to become later, under the aegis of Hughlings Jackson, the official organ of the Neurological Society, and to occupy, as it still does, a high position in medical literature. Of this journal Crichton-Browne was co-editor. Among his contributions were articles on "The Weight of the Brain and its Component Parts in the Insane" and on "The Nature and Cortical Localization of Muscular Sense."

He was elected President of the Medico-Psychological Association in 1878. His address on this occasion, in which he reviewed the recent developments in psychiatrical knowledge, was a striking illustration of his imaginative power and his felicity of diction. In the following year

his services to science and to the community were recognized by the University of St. Andrews in conferring on him the degree of LL.D. As President of the Psychological Section of the British Medical Association Meeting at Cambridge in 1880 he delivered an address "A Plea for the Minute Study of Mania," in which he pleaded for a more assiduous study of symptoms in the light of the recently acquired knowledge of cerebral pathology, and expressed the belief that it would be possible eventually to define in cases of insanity the particular parts of the brain involved. In 1884 Crichton-Browne submitted a report on the alleged over-pressure of work in public elementary schools concerning which public interest had been considerably aroused. Mr. Mundella, the Minister for Education, had not anticipated its nature, but the report was deemed so valuable that the House of Commons ordered it to be printed. When in 1886 the honour of knighthood was bestowed on him by Queen Victoria there was widespread satisfaction, both among the medical profession and the general public. At the British Medical Association Meeting at Leeds in 1889 Crichton-Browne gave an address in psychology on "The Hygienic Uses of the Imagination"—a subject affording full scope to his imaginative and literary powers. In that address he argued strenuously for the adoption of measures for the early treatment of mental disorders, and for the wider dissemination among the profession of a knowledge of medical psychology.

> "But if the treatment of insanity in its earlier stages—when it is in the green tree and more amenable to control than in the dry—thus devolves on general medical practitioners, and if the management of a considerable proportion of cases of insanity throughout their entire duration is entrusted to them, with or without specialistic assistance, it follows obviously that the study of medical psychology appertains to our profession as a whole and cannot be altogether relegated to any one small branch of it."

It is not possible to do justice here to his multifarious activities in the realm of medical psychology. His services were in constant request both by specialist societies and by the general public. Sir James Crichton-Browne was treasurer and later vice-president of the Royal Institution of Great Britain; chairman of the Council of the National Health Society; a former president of the Neurological Society and of the Medical Society of London. He was elected a Fellow of the Royal Society in 1883. The degree of Doctor of Science was bestowed on him by the University of Leeds and the LL.D. by Aberdeen and Edinburgh.

In 1922 he retired from the office of Lord Chancellor's Visitor in Lunacy, but happily continued to maintain his interest in medicine and in psychology, and to continue his activities in lecturing on these and allied subjects to audiences in various parts of the Kingdom. In 1926 he resigned the treasurership of the Royal Institution after holding it for thirty-seven years with conspicuous success. He had been a member of the Athenaeum for forty-five years, and of the British Medical Association for seventy years. At the age of 89 he unveiled the memorial bas-relief portrait of his old friend Sir Clifford Allbutt in the Cambridge Medical School, and spoke with unabated point and vigour. The centenary celebrations of the British Medical Association in 1932 were graced by a letter from his pen in the *British Medical Journal*, conveying congratulations and good wishes; in this Sir James referred to "the adolescent period in the life of the Association, the seventies and eighties of last century, when I took an active part in its affairs," and paid charming tributes to the work of Ernest Hart, Sir Dawson Williams (Editors of this *Journal*), and their successor.

Sir James Crichton-Browne was twice married. By his first wife, Emily, daughter of the late Dr. Halliday, he had two children, a son and a daughter; the former died last October. His first wife died in 1903, and in 1912 he married Audrey Emily, daughter of the late General Sir E. Bulwer and great-niece of Bulwer Lytton. Mr. Balfour Browne, K.C., the Parliamentary Counsel, was his younger brother, and his nephew is Professor Frank Balfour Browne, president of the Royal Microscopical Society.

SIR THOMAS STANTON, K.C.M.G., M.D., F.R.C.P.

Chief Medical Adviser to the Secretary of State for the Colonies

Sir (Ambrose) Thomas Stanton, who died in London on January 25 after a short illness, was born in Canada on November 14, 1875, and graduated M.D. from Trinity Medical College, Toronto, in 1899. After serving as house-surgeon at the Toronto General Hospital he continued his medical studies in London—at University College and the London Hospital—obtaining the English Conjoint qualifications in 1905 and the D.T.M. and H. of Cambridge in the following year. At the Hospital for Tropical Diseases he acted as house-surgeon to Sir Patrick Manson, and afterwards was registrar. Sir Patrick chose him for the post of demonstrator at the London School of Tropical Medicine in 1905.

Stanton went to the Malay States in the beginning of 1907 to assist Henry Fraser, the director of the Institute for Medical Research at Kuala Lumpur, in an attempt to discover the cause of beriberi. Their earliest observations were made on two groups of coolies employed in building a road through virgin jungle. One of the groups was supplied with polished rice, the other—working some three miles distant—with parboiled rice. During this investigation Stanton lived for the best part of a year in a little thatched hut which stood in a clearing in the jungle at the dead end of the new road, many miles from civilization and its comforts. Here he kept a look out for cases of beriberi among the coolies, and dispatched daily specimens of their food sealed up in wooden boxes to Fraser in Kuala Lumpur. This remote spot, surrounded by high impenetrable jungle, was chosen to eliminate any question of infection, and because there was no opportunity in such a place for the coolies to obtain any food except that which was supplied to them. Stanton's life was terribly lonely and monotonous, but as a result of their observations Fraser and he were able to show that beriberi was a disease of metabolism due to the consumption of a staple diet of rice from which the outer layers had been removed by polishing. They found that these subpericarpal layers contained certain "alcohol-soluble substances, minute in amount but of high physiological value in nutrition," the substances to which Funk, a few years later, gave the name of vitamins. Stanton and Fraser continued their investigations into the prevention and cure of beriberi until the beginning of the war, and in 1924 their numerous papers on this disease were republished in one volume under the title of *Collected Papers on Beriberi*. Stanton was a keen entomologist, and his work on mosquitos was as valuable as his work on

beriberi. The identification of mosquito larvae has become such a matter of course in malaria surveys that his pioneer work in this connexion is almost forgotten, but without it the difficulties of anti-malaria work in the Malay States would have been insuperable.

Almost the whole of the European staff of the Institute was seconded for war service, and Stanton was left to carry on in Malaya. His wisdom and efficiency, his readiness to help, his steadiness and his cheerfulness were of untold value during the years of the war, not only to the Government but to the whole community. In 1917 he investigated a fatal disease which had appeared among the labourers on rubber estates and was causing some alarm among the public. The outbreak was thought at first to be the result of toddy poisoning, but Stanton showed that it was due to infection with the organisms of a glanders-like disease, which he afterwards named melioidosis. His work on this subject was published in conjunction with Dr. William Fletcher. In 1920 he was appointed Director of Government Laboratories in the Malay States. His wisdom and good judgment led all to seek his advice in every kind of difficulty; those who asked never asked in vain, but received strength and good guidance at his hands and left him feeling better armed to face their troubles.

In 1926 Stanton was chosen by the Secretary of State for the Colonies for the newly created post of Chief Medical Adviser in the Colonial Office. His admirable work in this capacity was recognized far and wide, and the present Secretary of State invited him to continue for a further period of three years from April next. He was created C.M.G. in 1929 and K.C.M.G. in June, 1934. The Royal College of Physicians elected him a Fellow in 1926 and awarded him the Bisset Hawkins medal. In 1911 he was awarded the Craiggs Research Prize of the London School of Tropical Medicine, and in 1929 the Mary Kingsley Memorial Medal of the Liverpool School of Tropical Medicine. When his old University of Toronto conferred on him the honorary degree of D.Sc. in 1933 Stanton was delighted, and no other distinction he gained during his life gave him more pleasure than this.

Part of Stanton's duties at the Colonial Office was to act as a liaison officer between the Department and various medical bodies outside, and this, from his sound sense of judgment, he was particularly fitted to do. He was chairman of the Colonial Advisory Medical Committee and of the managing committee of the Bureau of Hygiene and Tropical Diseases. He was a member of the board of management of the London School of Hygiene and Tropical Medicine, of the Tropical Medical Research Committee, of the Medical Research Council, and of the British Empire Leprosy Relief Association. He was responsible for advising the Secretary of State on the numerous medical problems that require solution in the fifty or so Crown Colonies, each with its separate government and financial problems. During his tenure of office great progress was made in the medical services of these Colonies. In recent years it has been realized that deficient nutrition was responsible for a great deal of the ill-health of the native peoples of our possessions, and he took an active part in the formation of the Economic Advisory Council Committee on Nutrition in the Colonial Empire. He believed firmly that the welfare of the inhabitants of these territories was dependent on the co-ordination of the medical, agricultural, veterinary, and educational departments, and took active steps to ensure this. Every medical officer in the Colonial Medical Service regarded him as a personal friend, and was always assured of a welcome in his office on arrival home on leave. They realized how much he always did for them in various ways and how much he has done to promote the health and welfare of millions of people in the Colonial Empire by bringing up the standard of its medical services by quietly fighting innumerable and often very difficult and worrying battles.

In 1930 he married Dr. Elizabeth O'Flynn, M.R.C.P., who survives him. The funeral took place at Golders Green on January 27.

[The photograph reproduced is by Elliott and Fry, Ltd.]

E. J. TOYE, M.D., B.Sc., F.R.C.S.

After forty years of busy life in practice at Bideford, North Devon, Dr. Edwin Josiah Toye passed away on January 25 after a very brief illness. He had a brilliant career at St. Bartholomew's Hospital, taking his B.Sc. in 1892, with honours in physiology, obtaining both the junior and senior scholarships, the gold medal for obstetrics in the M.B., and being adjudged worthy of the gold medal in the B.S. He was ophthalmic house-surgeon under Mr. Vernon and then for a year house-physician at the Metropolitan Hospital. In 1898 he took a locumtenency at Bideford with Drs. Rouse and Gooding. He became Dr. Gooding's assistant after Dr. Rouse's death and later his partner and successor. He struggled single-handed during the war with a growing practice, and later was joined in partnership, first by Dr. C. W. Wilson and then also by Dr. S. C. Wake.

In addition to his routine general practice Toye always maintained his interest in eyes, and was ophthalmic surgeon to the Bideford Hospital, in which he was also senior medical officer for many years up to the day of his death. He also held many posts of responsibility and honour among his colleagues. He was at different times president of the South-Western Branch of the British Medical Association, chairman of the Barnstaple Division, and later president of the Devon and Exeter Medico-Chirurgical Society, and for many years a representative of his Division in the Representative Body of the British Medical Association. He also took part in municipal work, and in 1925 served as mayor of Bideford. During his year of office the famous Bideford Bridge was rebuilt, and Toye's name will go down to posterity engraved on its memorial stone. In the same year the new Bideford and District Hospital was opened. In 1903 he married a widow, Mrs. Keene, who had three children, and he proved himself a devoted husband and stepfather. Mrs. Toye died in 1933. The great and representative congregation which attended his funeral at Bideford Parish Church on January 28 testified to the immense respect and affection in which he was held.

Mr. E. W. Hey Groves writes:

Dr. Toye was my oldest and dearest medical friend. We entered St. Bartholomew's Hospital together in 1890, qualified in the same year, held resident appointments at the same time—he as ophthalmic and I as obstetric house-surgeon—and we have been closely associated in practice in the West of England ever since. It was in 1898, when I was in general practice in Chewton Mendip, that Toye came to stay with me; he then heard of a post at Bideford as a locumtenent, and there he has been in practice ever since. For the last forty years we have met every year, and generally I have gone down to stay with or near him, and have had the pleasure of seeing him

assume his rightful position as one of the most successful and most beloved of the practitioners in North Devon. He was the most conscientious and untiring worker, and although he has always had a cardiac lesion (which prevented his being accepted for military service during the war) he never spared himself in his devotion to his patients. He undertook the whole responsibility of a large general practice, and also kept up with his special ophthalmic work. His great knowledge and experience was fortified by constantly keeping in touch with modern progress, and right up to last year he hardly ever failed to go up to St. Bartholomew's for a postgraduate course. He was a pioneer in motoring, driving himself in a 4½-h.p. Benz in the early years of the century, and his own was the first car in North Devon.

Toye never learned to spare himself or to take recreation; his only holidays were the annual meetings of the British Medical Association. But he loved music, and I associate this with him from our student days when we attended Queen's Hall concerts to the last year when he came to Bristol to the opera with me. Our last close association was in 1935, when we travelled round the world on the B.M.A. tour. Toye's was a character of singular charm. He was always absorbed in the interest of his work and yet he never complained of its drudgery. He was devoted to his patients and unsparing of himself in his work for them. He always seemed to be happy, and he thus made those associated with him happy, too. He was never bad-tempered, and I confidently believe that in all his long life he never made an enemy. His cheery smile, his leonine head covered with thick curly hair, and his brave spirit will long be remembered in the North Devon town which he had made his own.

W. B. MACKAY, C.M.G., M.D.

Consulting Surgeon, Berwick-on-Tweed Infirmary

By the death of Dr. William Bertie Mackay, C.M.G., Berwick-on-Tweed has lost its senior medical practitioner. He was born in Edinburgh in 1863 and studied medicine at the University of Edinburgh and at Charing Cross Hospital, graduating M.B., C.M.Ed. (with honours) in 1884, and taking the M.R.C.S.Eng. in the following year. After a period as resident surgeon at the Edinburgh Royal Infirmary he engaged in postgraduate study in Vienna, Heidelberg, and Paris, and began practice at Berwick in 1887. Dr. Mackay, who proceeded to the M.D. with commendation in 1896, had for many years been surgeon to the Berwick-on-Tweed Infirmary, and was prominently associated with the Territorial movement. During the war he was senior medical officer at the Command Depot, Catterick, and served with the British Expeditionary Force in France and Flanders, attaining the rank of Lieutenant-Colonel, R.A.M.C.(T.), and being thrice mentioned in dispatches. He received the Territorial Decoration, and was a Justice of the Peace for the county and borough of Berwick. He joined the British Medical Association in 1904, and was chairman of the North Northumberland Division in 1923–4.

Dr. R. A. Welsh writes:

Our profession in North Northumberland and Berwickshire has lost one of its best-known and best-loved members by the death of Dr. W. B. Mackay. He was a remarkable man, as his life's record shows: a fine type of general practitioner, a good general surgeon with a sound knowledge of ophthalmic work, an honours graduate of Edinburgh who had studied in London, Vienna, Paris, and elsewhere. Perhaps his greatest interest in life was the development of Berwick Infirmary, where he laboured for over fifty years and was instrumental in building it up from a very primitive state to one of high efficiency. Apart from his profession his activities were manifold and various, as a short list of them will show. He had been president of the Rotary Club, the local branch of the British Legion, the Operatic Society, the Burns Club, and the Rugby football club. He was Sheriff of Berwick in 1925–6, and was made an Honorary Freeman of the town in recognition of distinguished war service. Forty-nine years ago he became an officer in the old Volunteers, afterwards the Territorials, and remained an officer till his death. Physically he was never robust, and suffered from heart trouble for many years, and underwent a serious abdominal operation not long before the war; but these disabilities did not deter him from joining up and going to France with the Northumberland Fusiliers in April, 1915. He had a distinguished war record, for two of his sons and a daughter also served over-seas. He was medical officer of his old battalion. During active service his health broke down, and he spent many months in hospital seriously ill, but his indomitable spirit and determination to get well carried him through. He got the C.M.G. for gallant service in 1916; was twice mentioned in dispatches, and made lieutenant-colonel in 1919. He returned to his private practice in Berwick and his hospital work, and carried on until six months before his death. He was an attractive personality. He had a cultured mind and a singularly gentle spirit. A striking characteristic was his great courtesy, which was the very essence of his being. Old and young, rich or poor, were all alike to him in this regard.

R. E. LAUDER, M.D., F.R.C.S.ED.

Many men in the public health service will learn with regret of the passing of Robert Enwraight Lauder, which was announced last week at page 261. For over thirty years medical officer of health for Southampton, he played the chief part in the development of its medical services. He was always alive to recent advances and keen to adopt any measures which would further their application. This was evidenced by the very early introduction of an *x*-ray unit in the tuberculosis clinic, one of the first in the country. It was seen again in the eagerness with which he welcomed the Act of 1929, for he recognized that by it the local authority could extend its usefulness in the direction of hospital services. The same alertness was shown in every sphere of his administrative work, and the smoothness with which the whole was operated showed not only his mastery of detail but his ability to obtain that co-operation, both inside and outside a department, which is so necessary to success. He was held in high regard by his juniors, to whom he gave every help and encouragement. One other of his activities must be mentioned. He served in the South African War, 1899–1900, in command of a detachment he himself had raised, and on his return he was elected a Freeman of the Borough. At the beginning of the great war he found himself suddenly called upon to undertake many duties in addition to those of health. Much additional hospital accommodation in the area was necessary, and he found it, and from its inception he acted as colonel commandant of one of the large V.A.D. hospitals. During his active career he took a great interest in the work of the Southampton Medical Society and of the Southampton Division of the British Medical Association, and was an ex-president of both bodies. Lauder was a kindly man, and his old colleagues will remember with affection the low rumbling voice which usually ended an

argument or a friendly piece of advice with a "Do you follow me?" Much sympathy will be extended to his widow and six daughters, and to his son, Surgeon Lieutenant R. E. Lauder.

D. F.

JOHN ADAMS, F.R.C.S.

Mr. John Adams died at the age of 86, after a long illness, at his house in Aldersgate Street, E.C., where he had practised for over sixty years. His death removes an honoured and beloved figure from the City of London, where his professional skill and goodness of heart were known to citizens in every walk of life. His father, Richard Adams, was a yeoman farmer of Marlborough, near Salcombe, in South Devon, and throughout life John Adams, in manner, speech, and bearing, was the West Countryman exiled in London, yet loving the City almost as much as his native Devon. At St. Bartholomew's Hospital he was known as a first-rate student and house officer. He had qualified in 1872, and became F.R.C.S. Eng. in 1888. Settling in general practice in Aldersgate Street, he was appointed medical officer to the Royal General Dispensary in Bartholomew Close, and generations of Bart's men knew him as a frequent visitor to the wards, a sound diagnostician, and a kindly friend. He was elected a Governor of the hospital in 1904. During the war he served with the rank of colonel R.A.M.C.T. as honorary surgeon to the Hospital for Officers at Fishmongers' Hall. He was for many years surgeon to the Hospital of the Sisters of the Poor, Paul Street, and surgeon to St. Margaret's Hospital, Kentish Town. As senior surgeon to the Sheffield Street V.D. Hospital for Women, and more particularly as medical officer in charge of the Thavies Inn centre for pregnant women with venereal disease and their newborn children, Mr. Adams did invaluable work, throwing himself heart and soul into his duties there while carrying on a busy private practice. He recorded in the *Proceedings of the Royal Society of Medicine* and in *St. Bartholomew's Hospital Reports* the results of treatment of ante-natal and post-natal syphilis. In recognition of this work he received from the Hunterian Society a special centenary medal for research in general practice; he was also elected president of that society, and in 1920 chairman of the City Division of the British Medical Association, of which he had been a member for fifty-four years.

On January 18 (writes L. A. P.) there passed away at Brighton one of the best beloved of our doctors, ARNOLD WINKELRIED WILLIAMS, at the age of 74, after a long illness, which started last year on a visit to a married daughter in Canada. He received his medical education in Edinburgh, London, Hamburg, Prague, and Vienna, graduating M.B., C.M. with honours at Edinburgh University, and afterwards taking the D.P.H. He settled in Brighton as a dermatologist, and was appointed physician for skin diseases at the Royal Sussex County Hospital and at the Royal Alexander Hospital for Sick Children. Dr. Williams became vice-president of the Dermatological Section of the Royal Society of Medicine; he was also vice-president of the Section of Dermatology when the British Medical Association held its Annual Meeting at Brighton in 1913. He contributed many articles on his specialty to the medical journals. He was buried at Brighton, the funeral service being held at St. Mark's, Kemp Town. The Archdeacon of Westminster (Canon F. L. Donaldson) conducted the service, with the assistance of the vicar, the Rev. F. Keeling Scott. The service was attended by leading representatives of the local medical profession, and many of the officials and members of the committees of the hospital which he had served so faithfully and so long. Dr. Williams had a very charming personality. It is difficult to imagine that he could have made an enemy. It can truly be said of him he was "beloved by all who knew him"—doctors, patients, friends. His colleagues in Brighton will miss an honest, upright, and learned English gentleman. He leaves a widow and three daughters.

The death of Dr. DAVID FAIRWEATHER on January 24 removes a practitioner long familiar to his patients and colleagues in the north of London. A graduate in arts (1876) and medicine (1879) of the University of Edinburgh he devoted himself from the outset to general practice, for the opportunities and responsibilities of which he cultivated a high regard, and he followed his profession effectively until some twelve months ago, when he elected to retire. He possessed in a high degree the qualities which invite and ensure confidence and obtained in a corresponding degree the affection and trust of his patients, while his standard of professional loyalty engaged the respect and goodwill of his colleagues. His personal interests included various public activities and sport in many forms, and he maintained his interest in the classics and had a rich fund of Scottish traditions and humour. His death means a loss to many circles to which he gave freely from the resources of his long experience and generous friendship. He had been a member of the British Medical Association for forty years.

After a short illness Mr. WILLIAM ALEXANDER MAIR died at Heckmondwike, Yorks, on January 10, at the early age of 39. A native of Port Knockie, Banffshire, he was a medical student at the University of Aberdeen, where he graduated M.B., Ch.B. in 1925. After two years as house-surgeon at the North Riding Infirmary, Middlesbrough, he held the post of medical superintendent of the Burnley Municipal Hospital until 1933, in which year he obtained the F.R.C.S.Ed. He then went into private practice at Heckmondwike, and two years ago was appointed honorary assistant aural surgeon to the Dewsbury Infirmary. Mr. Mair was also police surgeon at Heckmondwike and honorary surgeon to the local division of the St. John Ambulance and Nursing Association.

Dr. GUSTAVUS GEORGE GIDLEY died suddenly at Heyford House, Cullompton, Devon, on January 15. He was born at Gidleigh, Devon, in 1861, and from Queen's College, Taunton, went to King's College, London, and qualified as L.S.A. in 1885, taking the M.R.C.S. and L.R.C.P. diplomas in the following year. He was then in turn house-surgeon at the London Temperance Hospital, clinical assistant at the Royal Devon and Exeter Hospital, resident medical officer at the Morpeth Dispensary, and assistant medical officer at the Northumberland County Asylum. Dr. Gidley practised for a long time at Cullompton, and held various public appointments. He had been a member of the Exeter Division of the British Medical Association for twenty years, and was a past-president of the Devon and Exeter Medico-Chirurgical Society.

Dr. CHARLES HORACE ANDREWS, one of the best-known practitioners in Norwich, died on January 16, at the age of 76. A student of Edinburgh and St. Thomas's, Dr. Andrews took the Scottish triple qualification in 1891, and then indulged his love for foreign travel by serving as a ship surgeon and making several voyages to China, Japan, and the Cape. He took up practice in Norwich in 1895, becoming district medical officer and medical officer and public vaccinator for Norwich. He was also for some time surgeon and accoucheur to the Norwich Maternity Charity, and assistant medical officer and anaesthetist to the Norwich Workhouse Infirmary. His hobby was cycling, which he began in the "penny-farthing" days and continued for many years. He had been a member of the British Medical Association for forty-four years and took an active part in the work of the Division, holding office as chairman in 1922.

Medical Notes in Parliament

Both Houses of Parliament resumed on February 1.

The Parliamentary Medical Committee will meet on February 8. An open meeting of M.P.s is arranged under its auspices on February 17, at which Lord Horder will speak about the Empire Rheumatism Council.

The Blind Persons Bill passed through committee in the House of Commons on February 1.

Population (Statistics) Bill

In the House of Commons on February 1 the Population (Statistics) Bill was considered in committee. The object of the Bill is to extend the scope of the particulars which can at present be asked for on the registration of a birth, stillbirth, death, or marriage, and so to provide the statistical evidence needed for practical consideration of the problems of the future population of Great Britain to which the decline in the birth rate has given rise.

Sir KINGSLEY WOOD moved a number of amendments which had been put down in the light of a previous discussion on the Bill. He said that instead of the ordinary census procedure, to which objection had been taken, it had been decided to substitute a limited number of defined but simple matters of which particulars might be required. The person who would supply the particulars would be required to give only the facts within his or her knowledge. If such person had not the knowledge a statement to that effect would relieve that person from any obligations in the matter. Such particulars were to be furnished as from July 1 next.

One amendment would ensure that the information given would be secret and privileged. The particulars to be asked for would supply information about the degree of fertility of a mother, childless wives, and matters requisite for statistical purposes. He understood that there was no objection among members of the House to these particulars being asked for. Certain supplementary lines of investigation could also be made on the information obtained. Particulars furnished of a mother's issue, living or dead or stillborn, would help in the further investigation of the high rate of infantile mortality. Cancer in women had been studied from the point of view of married and unmarried women, and the investigation could now be carried further from the aspect of childless wives and those who had produced children.

He was prepared to accept an amendment to fix the period of operation of the measure at ten years. It might be that during the next few years experience would show how far these matters sufficed, and whether any alteration or modification of the scheme was desirable. Also, before the end of ten years they might have sufficient information on which the whole matter would have to be considered in its larger aspects.

Sir FRANCIS FREMANTLE said that the question was whether the Bill had not been cut down too much. The House had decided to restrict inquiries to the smallest limits. If it was found that there was too much restriction an amending Bill would have to be prepared. The real seriousness of the depopulation question was not understood by the House. They would be running the risk of losing precious years if they did not get the vital statistics which were required.

The amendments moved by Sir Kingsley Wood were agreed to. It was also agreed that registration officers, who were paid on a fee basis, should, after payment of 2s. 6d. an entry for the first twenty entries, be paid at the rate of 1s. 5d. per entry, whether of a birth or a death, instead of 1s. for a birth and 1s. 3d. for a death, as at present.

Mr. O. LEWIS also moved an amendment providing that the Bill should continue in force until June 30, 1948, and no longer, unless Parliament otherwise determined. Sir FRANCIS FREMANTLE said that this was a most astonishing amendment. They might as well abolish the whole registration scheme of the country in ten years' time. This was a very valuable measure, and it was childish to bring it to an end after ten years.

Sir KINGSLEY WOOD accepted the amendment. He said that following the experience of other countries it might be necessary before the end of ten years to examine the larger questions which would be involved in regard to population.

The amendment was agreed to and the committee stage was concluded.

Deaths and Disablement from Silicosis

On February 1 Sir SAMUEL HOARE, in reply to Mr. J. Griffiths, said that in 1937 there were 643 applicants to the Medical Board for certificates of disablement or suspension under the Various Industries (Silicosis) Scheme from coal miners in Great Britain; 286 certificates were granted. In 1936 there were 674 applications, and 319 certificates were granted. From anthracite mines there were 230 applications in 1937, 132 certificates being granted; and in 1936 the figures were 319 and 182. In 1937 seventy-two deaths were certified as due to the disease, against seventy-seven in 1936. In anthracite mines there were thirty-five deaths in 1937 and thirty-nine in 1936.

Notes in Brief

Sir Kingsley Wood has received reports of water shortage of varying degree from four boroughs, four urban districts, and parts of sixteen rural districts. In seven of these, additional supplies have been provided, and in the remainder the Minister is in communication with the local authorities on the remedial measures required.

Mr. W. S. Morrison stated on February 1 that the technical report of the Committee on Poultry Diseases would be generally available in the course of a week.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Chancellor has received from the Rockefeller Foundation a letter stating that action has been taken to provide to the University of Cambridge up to £8,000 towards support of research in its Department of Experimental Medicine for the five-year period January 1, 1938, to December 31, 1942, the amount available in any one year of the grant not to exceed £1,600. It is intended that these funds shall be used for the salaries of a pathologist and a psychiatrist, and for supplementing the amount which the radiologist receives from Addenbrooke's Hospital.

The Board of Management of the Frank Edward Elmore Fund will shortly award a studentship for research in medicine. These studentships are open to male graduates of any university who were born in any country within the British Empire other than Scotland. The student appointed will work in the Department of Medicine under the direction of the Regius Professor of Physic. The commencing salary will be £300 a year, and the appointment will be for two years in the first instance. Further information may be obtained from the Regius Professor of Physic, Department of Medicine, University of Cambridge, to whom applications, together with three testimonials, a statement of previous appointments, and copies of published papers should be sent not later than February 28.

On Monday, February 14, at 5.15 p.m., Professor J. H. Hutton will give an inaugural lecture on "Anthropology as an Imperial Study" in the theatre of the Arts School.

UNIVERSITY OF LONDON

At a meeting of the Senate, held on January 26, with the Vice-Chancellor in the chair, it was reported that Mr. P. H. Mitchiner, M.D., M.S., F.R.C.S., had been appointed by Convocation, on the election of the graduates in medicine, to be their representative on the Senate for the remainder of the period 1937–41, in place of Dr. W. G. Spencer, resigned.

The William Julius Mickle Fellowship for 1938 was awarded to Dr. Leonard Colebrook.

UNIVERSITY OF BIRMINGHAM

Three William Withering Lectures on chemical transmission of the effects of nerve impulses will be given in the large theatre

of the Medical Faculty Buildings, Edmund Street, on February 17 and 24 and March 3, at 4 p.m. The first two lectures will be delivered by Sir Henry Dale, C.B.E., M.D., F.R.S., F.R.C.P., director of the National Institute for Medical Research, on February 17 and 24, and the third by Professor Francis R. Fraser, M.D., F.R.C.P., professor of medicine in the University of London and director of the Department of Medicine of the British Postgraduate Medical School, on March 3. Members of the medical profession and students of medicine are invited to attend.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

A Comitia of the Royal College of Physicians was held on January 27, with the President, Viscount Dawson of Penn, in the chair.

The following were elected representatives of the College: Dr. A. S. Barnes on the Court of Governors of the University of Birmingham; Dr. J. A. Nixon on the Court of the University of Bristol; Dr. A. Feiling on the Council of the Queen's Institute for District Nursing.

The following were appointed delegates: Dr. G. F. Buchan to the Congress of the Royal Sanitary Institute at Portsmouth, July 11 to 16; Dr. A. Ramsbottom to the Congress of the Royal Institute of Public Health at Blackpool, May 31 to June 4; Professor Roy S. Dobbin to the International Congress of Leprosy at Cairo, March 31; and Dr. J. D. Rolleston to the eleventh International Congress of the History of Medicine to be held at Zagreb, Belgrade, Sarajevo, and Ragusa, September 3 to 11.

Membership

The following candidates, having satisfied the Censors' Board, were admitted Members of the College:

Allan William Abramson, M.B.Camb., Cécile Helen Denise Asher, M.D.Lond., Harry Baker, M.B.Manch., Richard Erskine Bonham-Carter, M.B.Camb., Edward Aloysius Joseph Byrne, M.D.Belf., John Houghton Colebatch, M.D.Melb., Seymour Donald Mayneord Court, M.B.Birm., Samuel Barnet Dimson, M.D.Lond., James Findlay Dow, M.B.Camb., William Robert Macfarlane Drew, M.B.Sydney, Captain R.A.M.C., Tom Foulds, L.R.C.P., Thomas Bones Hamilton Haslett, M.D.Belf., James Holmes Hutchison, M.B.Glasg., Martin Cyril Gordon Israëls, M.D.Manch., Byron Arnold Ryland Disraeli Josef, L.M.S.Ceylon, Robert Bews Kerr, M.D.Toronto, Abdel Hamid Mustapha Kersha, M.B.Cairo, Hah Liong Lee, M.B. Hong Kong, Robert George Mallory Longridge, L.R.C.P., John Joseph McCann, M.B.Lond., Edward Rowland Alworth Merewether, M.D.Durh., Henry Francis Moore, M.D.Dubl., Noah Morris, M.D.Glasg., Alexander Jeremiah Orenstein, C.M.G., M.D.Jefferson Coll., Andrew Robertson, M.B.Ed., James Charles Shee, M.B., N.U.I., Horace Minton Shelley, F.R.F.P.S., Reginald Norman Tattersall, M.B.Lond., Prem Nath Wahi, M.D.Lucknow, Hugh John Wallace, L.R.C.P., Margaret Isabel Williams, M.B.Manch.

Licences and Diplomas

Licences to practise physic were conferred upon the following 159 candidates (including thirteen women) who had passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the necessary by-laws:

H. Acton, C. L. Angell, M. G. Baker, W. H. J. Baker, R. E. Ball, A. D. Barnett, H. C. Barry, C. F. Barwell, A. D. Bateman, C. A. Bathfield, K. M. Bhansali, D. L. Bennett, J. R. Bignall, Joan M. Boissard, V. H. Bowles, W. E. W. Bridger, B. A. M. Brown, C. N. Brown, B. Brownscombe, J. H. Bulleid, Jacqueline V. Burch, G. A. Burfield, P. E. G. Burnett, B. Burns, Elizabeth M. Cadbury, D. M. Carding, J. A. Chamberlin, I. C. Chopra, E. Clifford-Jones, S. Cohen, H. Cooper, T. A. Cox, R. V. Coxon, A. Crook, Dorothy L. Crossley, Eveline M. Cumming, S. S. Davidson, E. B. Davies, D. R. Davis, J. J. Davis, M. Dean, J. de Swiet, J. H. Dobree, A. S. Dods, E. G. Dolton, I. G. B. Drybrough-Smith, Avis M. Dyer, P. S. Edgecombe, A. M. Edwards, T. A. W. Edwards, P. G. Epps, C. C. Evill, A. C. Ferguson, J. O. Fielding, W. Fine, E. S. Foote, A. B. Fountain, J. E. Francis, B. J. Frankenberg, A. S. Garrett, P. F. B. Gillett, L. J. Grant, S. I. Green, P. R. B. Grimaldi, S. Grossmark, R. W. Gunderson, M. Halberstaedter, J. W. Hallam, R. N. Herson, J. H. Hill, A. M. Hutton, Stella M. Instone, L. A. Ives, S. Jackson, E. L. James, P. H. Jayes, S. M. Jenner, E. C. Jones, James M. Jones, John M. Jones, R. C. Jones, B. A. R. D. Josef, M. Kaufman, J. W. L. Kemp, W. M. Kirkby, H. G. Langley, R. W. Lass, J. D. O'D. Lavertine, R. P. Lawson, A. S. Lee, J. B. Longmore, R. Lyons, I. Mackenzie, F. T. Madge, O. T. Mansfield, K. A. Marandi, Elizabeth C. Marshall, Mary O. Masters, S. W. Maxwell, O. Mectapfel, A. D. Messent, D. H. R. Montgomery, W. E. D. Moore, D. N. B. Morgan, J. N. Morrisen, D. V. Morse, B. B.-G. Nehaul, R. G. W. Ollerenshaw, P. J. O'Meara, T. Parkinson, J. N. M. Parry, C. Phillips, A. B. Pollard, K. W. Powell, D. W. Pugh, M. W. Radzan, L. Ray, M. T. Read, R. Rhydwen, K. S. Richard, H. J. Richards, D. A. Richmond, J. W. Richmond, A. T. M. Roberts, Gwen Roberts, Mary A. Rogerson, F. Rosenberg, R. W. N. L. Ross, T. R. Savage, T. T. Schofield, J. V. Shannon, N. P. Shields, G. L. B. A. Silva, G. H. A. Simmons, J. R. Sinton, F. M. Smith, H. D. Smith, K. Smith, H. W. Starkey, D. C. Sturdy, A. W. Taylor, K. H. Tayor, R. L. Thomson, A. H. Thomson, K. B. Thornton, A. G. G. Toomey, Ivy M. Tuck, Audrey V. Turner, W. M. L. Turner, N. Vere-Hodge, H. P. Watts, J. M. Wedderspoon, H. F. Whalley, T. E. Whitby, D. J. Wigginton, E. D. Williams, A. R. Wood, Jean R. Young, W. B. Young.

Diplomas in Psychological Medicine and Laryngology and Otology were conferred jointly with the Royal College of Surgeons of England. The names of the successful candidates were printed in the report of the meeting of the Council of the Royal College of Surgeons published in our issue of January 22 (p. 209).

Diplomas in Public Health were granted, jointly with the Royal College of Surgeons, to W. L. H. L. Bell, V. D'A. Blackburn, R. R. Clipstein, P. N. Gokhale, J. Landon, Caroline A. Meade, Gladys M. G. Spencer, Agnes B. Sutherland, Christina J. Thomson, Patricia S. Warren, J. O. Williams, V. F. F. Winslow.

Diplomas in Tropical Medicine and Hygiene were granted, jointly with the Royal College of Surgeons, to H. Prasad, B. M. Rao, A. C. Seneviratne, D. H. Waldron.

Diplomas in Anaesthetics were granted, jointly with the Royal College of Surgeons, to A. H. L. Baker, A. H. Bruce, Eva G. Byrde, J. C. Buckley, Bessie E. Cook, Ellen B. Cowan, M. H. A. Davison, A. J. S. De Freitas, L. M. De Silva, S. F. Durrans, Florence Faulkner, W. B. Gough, G. Gray, J. R. G. Harris, J. K. Hasler, Ursula Y. Im Thurn, Freda C. Kelly, J. O. Moffat, D. A. Prothero, G. R. Rawlings, W. H. Scriven, Captain R.A.M.C., E. W. O. Skinner, G. C. Steel, O. Walker, and to the six candidates whose names were printed in the report of the meeting of the Council of the Royal College of Surgeons published in our issue of January 22 (p. 209).

Lectures

The following lectures will be delivered at the College, Pall Mall East, S.W., all at 5 p.m.

The Milroy Lectures on "The Public Health Aspect of Heart Disease in Childhood" by Dr. B. E. Schlesinger on February 24 and March 1; the Goulstonian Lectures on "Some Deficiencies of Nutrition and their Relation to Disease" by Dr. C. C. Ungley on March 3, 8, and 10; the Lumleian Lectures on "Pain of Central Origin" by Dr. George Riddoch on March 15 and 17; and the Oliver-Sharpey Lectures on "Recent Observations on the Morphology of the Neuron, and on the Changes which it Undergoes in Disease," by Dr. J. G. Greenfield on March 22 and 24.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Special Lectures

A special lecture on "The Prehistoric People of Mount Carmel" will be delivered by Sir Arthur Keith, M.D., F.R.S., F.R.C.S., Master of the Buckston Browne Farm, in the theatre of the College, Lincoln's Inn Fields, W.C., on Monday, February 14, at 5 p.m.

Dr. W. E. Gye, Director of the Imperial Cancer Research Fund, will deliver a special lecture on "Some Recent Work in Experimental Cancer Research" in the theatre of the College on Wednesday, February 16, at 5 p.m.

Fellows and Members of the College are invited to attend the lectures. Students and others who are not Fellows or Members of the College will be admitted on presenting their private visiting cards. Tea will be served before the lecture.

The lecture by Professor P. B. Ascroft on an experimental study of the surgical treatment of arterial hypertension, arranged to be given at the College on February 11, has been postponed.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—N. D. Cousins, T. C. Hallinan, B. M. Hulse, C. K. Westropp.

MEDICINE.—P. H. Beamish, A. W. Frankland, D. H. Fowler, T. C. Hallinan, B. T. Jones, G. E. King-Turner, C. K. Westropp.

FORENSIC MEDICINE.—P. H. Beamish, A. W. Frankland, D. H. Fowler, T. C. Hallinan, C. K. Westropp.

MIDWIFERY.—A. N. Boyle, G. H. L. Bullmore, A. W. Frankland, A. J. Patenall, M. Tombuk, T. G. Viljoen, C. K. Westropp.

The diploma of the Society has been granted to D. H. Fowler, B. T. Jones, and C. K. Westropp.

The Court of the Society has awarded the Gillson Scholarship in Pathology for 1938 to Dr. R. H. S. Thompson of the University of Oxford and Guy's Hospital, who is at present working in the Rockefeller Institute Hospital (corrected announcement).

No. 3

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended January 22, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 125 great towns (i) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns (ii) in Eire. (e) The 10 principal towns (iii) in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1928-36 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	30	4	8	1	—	34	8	10	1	—		
Deaths		4	—				3	3				
Diphtheria	1,737	179	252	59	56	1,294	153	240	50	50	1,321	221
Deaths	36	3	4	7	—	34	7	8	4	1		
Dysentery	250	63	150		—	21	4	6		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	6	—	—		—	10	—	2		—		
Deaths		—					3					
Enteric (typhoid and paratyphoid) fever	19	4	3	5	3	61	2	4	14	1	27	—
Deaths	1	—	—	1	—	4	—	—	—	—		
Erysipelas			104	10	6			59	5	7		
Deaths		1					1					
Infective enteritis or diarrhoea under 2 years												
Deaths	69	13	7	6	6	33	10	9	8	3		
Measles			1,544		833*			41		1		
Deaths	48	3	14	6	15	6	—	1	3	—		
Ophthalmia neonatorum	100	6	28		—	72	10	35		—		
Deaths												
Pneumonia, influenzal§	1,321	117	27	3	39	3,135	327	476	102	12	1,787	229
Deaths (from Influenza)	73	12	12	—	2	1,137	273	256	30	50		
Pneumonia, primary			345	19				533	14			
Deaths		33		16	12		37		36	42		
Polio-encephalitis, acute	—	—				—	—					
Deaths		—										
Poliomyelitis, acute	8	1	5		—	3	—	—		—		
Deaths		—					1					
Puerperal fever	7†	7	16	2	—	42	4	17	1	—		
Deaths		1‡					2‡					
Puerperal pyrexia	182	12	30		6	147	17	28		2		
Deaths												
Relapsing fever	—	—	—		—	—	—	—		—		
Deaths												
Scarlet fever	2,459	165	520	114	78	1,671	163	317	79	38	2,273	274
Deaths	—	—	1	2	—	5	1	2	3	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths	—	—		—	—	—	—		—	—		
Whooping-cough			47		7			576		19		
Deaths	20	2	1	2	1	28	7	33	5	3		
Deaths (0-1 year)	469	90	69	38	31	440	86	108	63	41		
Infant mortality rate (per 1,000 live births)	78	74				70	71					
Deaths (excluding stillbirths)	5,656	1,105	886	254	206	7,764	1,711	1,379	355	302		
Annual death rate (per 1,000 persons living)	13.9	13.9	16.6	17.2	18.3	19.3	21.3	26.8	24.2	28.9		
Live births	6,830	1,343	915	362	220	6,046	1,170	947	306	230		
Annual rate per 1,000 persons living	16.8	16.9	18.7	24.5	19.5	15.1	14.6	19.4	20.9	22.0		
Stillbirths	284	41				308	37					
Rate per 1,000 total births (including stillborn)	40	30				48	31					

(i) 122 great towns in 1937
(ii) 12 " " " "
(iii) 9 " " " "

* 832 cases in Belfast alone.
† All cases notified as puerperal pyrexia after October 1, 1937.
‡ Deaths from puerperal sepsis.

§ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland

EPIDEMIOLOGICAL NOTES

Typhoid Fever

The addition of 54 cases not previously reported, the majority of which originated in other areas but had some connexion with the Croydon outbreak, brings the total for primary and secondary cases to 344, compared with 290 cases recorded last week. Two additional deaths during the week bring the total number to 43 at the time of going to press. Three cases of typhoid fever, two of which were in the same family, have been reported in Chatham during the last fortnight, with one death. Water pollution has been excluded as the source of the outbreak, and it is possible that infection took place in some other area. Since January 20, 14 notified cases of typhoid fever, since confirmed, with three deaths, have been reported in the Bridgwater and Highbridge areas in Somerset. The inhabitants of these areas were advised by broadcast during last week-end to boil all water and milk supplies before use. During the same period 10 cases have been reported in a Pembrokeshire outbreak, which originated at Solva and St. David's. A male adult patient has died from typhoid fever in the Scilly Isles. Despite these fresh outbreaks of typhoid in three different areas the disease is less prevalent in England and Wales than in the previous week, and the figures are much lower than those for the corresponding week last year and than the median value for the last nine years.

Dysentery

Dysentery figures show a considerable drop in England and Wales—200 in the week under review compared with 288 in the previous week—but the incidence is still high compared with the corresponding week last year, when no more than 21 cases were notified. Swindon is the only centre in which a fresh outbreak of any magnitude has appeared; in the previous week only 5 cases were notified, but in the present week an explosive outbreak involving several hundred cases has been reported. The mode of infection and spread of dysentery continues to baffle all investigation; examination of milk and water usually yields negative results, but uncooked vegetables remain a likely source. The characteristic mildness of the disease facilitates spread, as it encourages lack of observance of the elementary rules of personal hygiene.

Influenza

The figures for influenzal pneumonia in England and Wales show an appreciable reduction as compared with those for the preceding week, the figures being 1,321 against 1,647, and very much lower than in the corresponding week last year, when there were 3,135 cases. A similar reduction was observed in the figures for London —117 against 159 for the previous week, and 327 for the corresponding week last year. The figures of deaths from influenza show an even more pronounced decrease as compared with last year; for England and Wales the numbers were 1,137 and 73 respectively, and for the county of London 273 and 12 respectively.

Measles

In Belfast 832 cases of measles were notified during the week under review compared with 567 in the previous week. The Glasgow figures show an appreciable decrease —1,077 against 1,409—while in Edinburgh there was a proportionate decrease—214 against 327. In Manchester 832 cases were reported during the week under review compared with 750 recorded last week. As in the previous week the daily number of measles cases admitted to the L.C.C. fever hospitals varied from 20 to 30, the average being 25; during the same week the average daily admissions for diphtheria and scarlet fever were 29 and 22 respectively. The deaths from measles in England and Wales rose during the week from 44 to 48, but in London there was a decrease of six on the figure of 9 for the previous week.

Medical News

Sir Walter Langdon-Brown will give a lecture on "The Contribution of Adler to General Medicine" before the Medical Society of Individual Psychology, 11, Chandos Street, W., on Thursday, February 10, at 8.30 p.m. Visitors are invited.

At a meeting of the Pharmaceutical Society of Great Britain to be held at 17, Bloomsbury Square, W.C., on Tuesday, February 8, a lecture on "Modern Points of View and Methods in Pharmacognosy" will be given by Dr. R. B. Wasicky, professor of pharmacognosy in the Pharmaceutical Institute of the University of Vienna. Professor Wasicky was awarded the Hanbury Medal last year, and this occasion is being taken to present the medal to him. The chair will be taken by the president at 8.30 p.m.

In our advertisement columns this week the University of Manchester invites applications for the Sir Henry Royce Research Fellowship. The Fellowship, which is open to graduates of a British University only, is for research on either "The Common Cold: Its Nature, Prevention, and Cure" or "Influenza: Its Nature, Prevention, and Cure," and is of the value of £500 per annum tenable for a period of three years. Applications should reach the registrar of the University not later than February 28.

The dinner of the Durham University Society (London) was held at the Florence Restaurant on January 27. The president, Lord Cadman, took the chair. Dr. Nathan Raw proposed the toast of "Alma Mater," and Miss E. Rathbone, M.P., the toast of "The Society." Among the medical graduates attending the dinner were Professor J. W. H. Eyre, Mr. R. Christie Brown, Colonel A. H. Proctor, and Professor G. Grey Turner.

The twentieth anniversary of the death of Lieutenant-Colonel John McCrae, C.A.M.C., consulting physician B.E.F., France, was commemorated on January 29 at the British military cemetery at Wimereux. John McCrae graduated in medicine at the University of Toronto in 1898. He was co-author with the late Professor Adami of a well-known textbook on pathology, and contributed many articles on pathology and clinical medicine to the medical journals. He is best known to the world at large as the author of the rondeau "In Flanders Fields." Among the wreaths laid on his grave last Saturday was one of Flanders poppies.

Dr. Haven Emerson, professor of public health, College of Physicians and Surgeons, Columbia University, New York, was given an honorary doctor's degree at the recent celebration of the centenary of the foundation of the University of Athens.

The fiftieth anniversary of the Institute of Morbid Anatomy at Tokyo has recently been celebrated under the presidency of the rector, Professor Magayo.

Dr. William M. Guilford of Lebanon, Pennsylvania, said to be the oldest living physician in the United States of America and probably in the world, celebrated his 105th birthday on November 26th, 1937. His grandfather lived to be 95 and his father to be 94.

Dr. W. W. Adamson (Lincoln's Inn) and Dr. G. V. Craine and Dr. J. J. O'Donoghue (Gray's Inn) were called to the Bar on January 26.

The December number of *Medical Classics* is devoted to William Withering, a biographical sketch and a bibliography being followed by a reprint of his *Account of the Foxglove*, 1785. This is now one of the scarcer medical classics, the few copies which turn up occasionally on the market fetching approximately £50.

According to recent statistics, in the spring of 1937 there were 55,259 medical practitioners in Germany, of whom 6,713 (12.1 per cent.) were in Berlin. Bavaria came first with 6,760 doctors, the Rhine province came next to Berlin with 6,335, followed by Saxony with 4,030.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
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SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

The "Emergency Bag"

"EX-SERVICE" writes: I should be grateful if readers would give their opinion as to what they consider the minimum contents of the general practitioner's "emergency bag."

Incapacitating Diarrhoea

"MEDICO" writes: My own experience may be of use to "Stug" and "Emdee." If my bowels are moved every day a loose and toxic diarrhoea develops, and the more fluid I drink the more am I liable to this. I find it best if my bowels are moved three or four times a week (every other day or so), and I therefore limit my fluid intake to this end—four cups of fluid a day in the winter. I naturally avoid foods with a good deal of roughage—for example, cabbage, lettuce, etc. The condition may be due to a relative lack of power of absorbing water from the colon. During the summer I can drink much more, on account, no doubt, of the increased sweating from the skin. I don't rely on drugs.

After-treatment of Circumcision

Mr. V. R. CLIFTON, Ch.M., writes in reply to "A.B.C." (January 29, p. 264): I have had considerable experience of adult circumcisions, and in about 50 per cent. of the cases sensitivity of the glans penis has been a troublesome post-operative symptom. I have found percainal ointment (Ciba Ltd., 40, Southwark Street, London, S.E.1), which contains 1 per cent. percaine, to be most efficacious in these cases. Its analgesic effect lasts about eight hours, and it should be applied two or three times a day until the glans loses its sensitivity. A smear of this ointment applied to the glans penis before coitus is also most helpful to those patients who complain of premature ejaculation.

Squatting Position in Defaecation

"D. M. M.," in reply to "Vis Medicatrix" (*Journal*, January 22, p. 213), reports that several years ago he bought what he thinks may be the "simple device," fitting round the base of the pedestal, which "Vis Medicatrix" asks for. He bought it from P.A.F.R. Co. (Proper Adjustable Foot Rest Co.), Newark-on-Trent, Notts. "D. M. M." still uses it.

Nocturnal Twitching of Lower Limbs

"M.O." writes: With reference to the letter by "Wilts" concerning nocturnal twitchings, I have a patient suffering from what appears to be the same complaint. She is a woman of 40 who has had these twitchings all her life, but only when she is very tired; they usually start when she sits down after dinner. The only thing that stops them is for the patient to get up and walk about. If she goes to bed they do not keep her awake, but sometimes if she is wakened with a start the twitchings begin again. They are not visible movements, but, as she describes them, "feel like an inward creepiness." Apart from this her health appears to be extremely good.

Income Tax

Employment by Steamship Line

"STEAM" is a British subject. He has accepted an appointment as ship surgeon in a Canadian line, and intends to make his future headquarters in Canada, though he will probably spend about forty-five days a year in the United Kingdom. He has hitherto lived with his mother, but this will no longer hold good.

*** The facts are distinctly similar to those in the case of Commissioners of Inland Revenue *v.* Combe, decided by the High Court in 1932. Mr. Combe, who had been resident in the United Kingdom, left to take up an appointment for three years in New York, but visited the United Kingdom each year on his employer's business. During that time he had no fixed place of abode here, but resided in hotels when in this country. The High Court held that the Commissioners who had discharged the assessment on Mr Combe had evidence to support their decision, and declined to interfere. We suggest that our correspondent might put forward this case as similar to his own if he is asked to pay United Kingdom tax on his emoluments.

LETTERS, NOTES, ETC.

Uniovular Triplets

Dr. JAMES A. WATERMAN (Colonial Hospital, Port of Spain, Trinidad) sends the following account of a case of uniovular triplets. The mother, who is aged 35, has had eleven pregnancies; all the children except the second and third are alive and normal. The second pregnancy ended in abortion, and the third child died at the age of 11½ months. The grandmother had had fifteen children, including two sets of twins. Labour pains started at 2 a.m. on October 2, 1937. The first membrane ruptured before admission to hospital. A female infant was delivered at 7.50 the same morning, L.O.A.; weight 5 lb. 10 oz., length 18½ inches. The second membrane ruptured at 8.5 a.m.; the infant—a female, footling presentation—weighed 4 lb. 8 oz. and measured 18 inches. The third membrane ruptured, and the patient was delivered at 8.20 a.m. of a female infant, the presentation being a R.O.A.; the weight was 4 lb. 6 oz. and the length 18 inches. The placenta was delivered with membranes complete at 8.30 a.m. There was one placenta, one chorion, and three amnions.

Treatment of Impetigo

Dr. A. W. DAVISON and Dr. T. D. CULBERT (Manchester) write: During 1937 we treated a considerable number of cases of impetigo with mineroleum zinci c ichthammol (Woolley), containing 2½ per cent. ichthyol and zinc oxide. We were so impressed with the results of this treatment in private patients that we prescribed a similar ointment for panel patients. The longest time taken for a complete cure was ten days, and in most cases the lesions cleared up in less than a week. We instructed the patients to apply the ointment night and morning after removing any crusts with cotton-wool soaked in olive oil, and to refrain from washing the face during treatment.

Oxygen Want and Oxygen Therapy

In a leading article on this subject (*Journal*, January 29, p. 235) we stated that "even the simplest tents . . . cost up to about thirty to forty shillings a day to run." The British Oxygen Company Limited now write: "An oxygen tent uses anything from 3 to 7 litres a minute. Allowing for occasional flooding and wastage and for the delivery and collection of cylinders, the cost to a hospital of running a tent, buying directly the appropriate cylinders, should be 15s. a day, and to hospitals which use their oxygen from batteries of cylinders through pipe-lines, considerably less."

The Slough Social Centre

A typist's error in our article on this subject last week (p. 246) made a phrase near the foot of the first column read "skilled medical supervision and national health insurance." It should have read "*school* medical supervision."